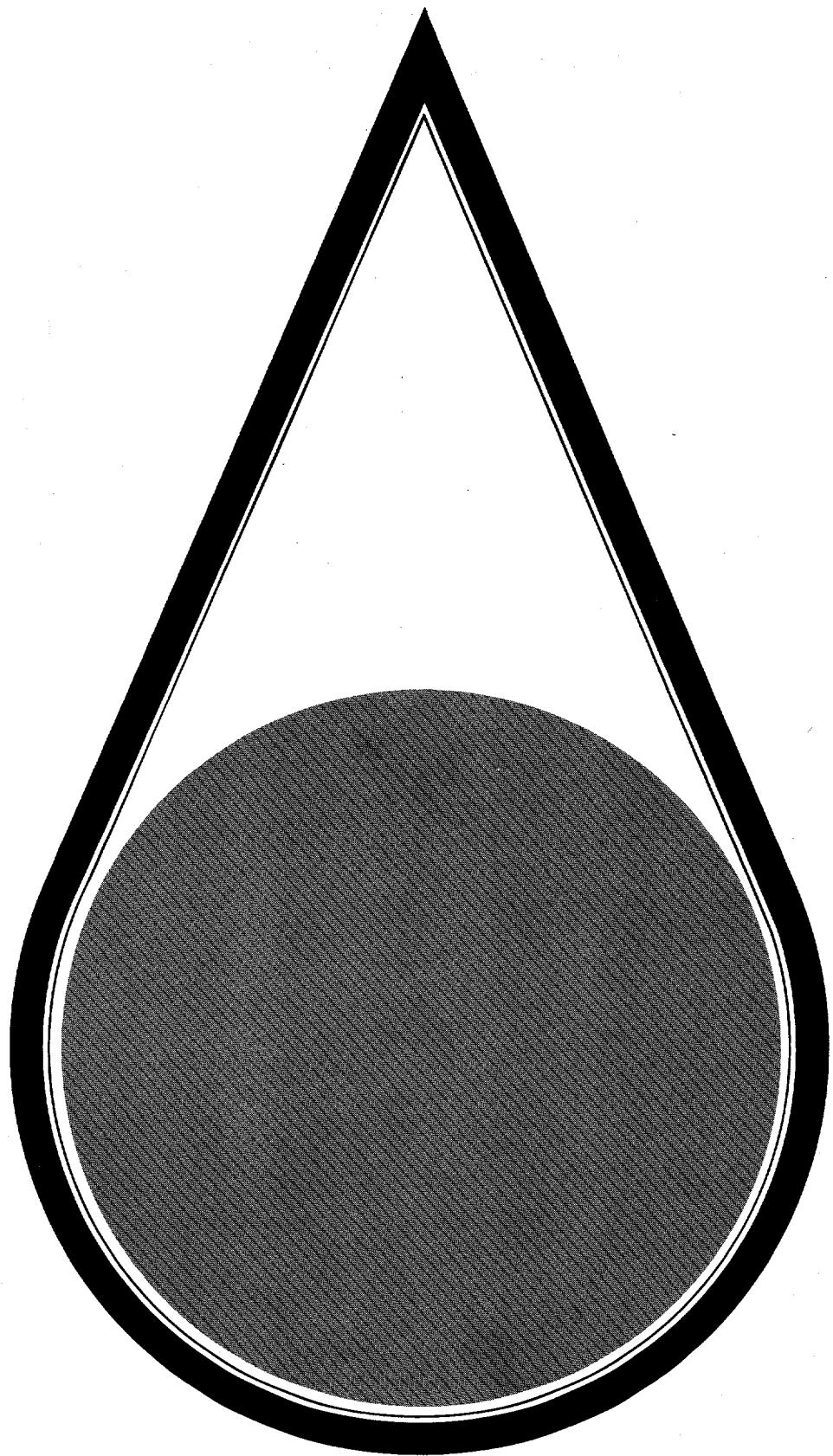


**INSTREAM CONTAMINANT STUDY - TASK 1**  
**WATER SAMPLING AND**  
**ANALYSIS**

Office of Natural Resources  
and Economic Development  
Tennessee Valley Authority



**WATER SAMPLING AND ANALYSIS**

**TASK 1**

**INSTREAM CONTAMINANT STUDY**

**Prepared for**

**U.S. Department of Energy  
Oak Ridge, Tennessee**

**Under Interagency Agreement No. DE-AI05-84OR21444**

**Office of Natural Resources and Economic Development  
Tennessee Valley Authority  
April 1985**

## CONTENTS

	<u>Page</u>
1.0 INTRODUCTION.....	1
1.1 PURPOSE.....	2
1.2 SCOPE.....	2
2.0 SAMPLING STATIONS AND PARAMETERS.....	3
2.1 Baseflow Water Quality Survey.....	3
2.2 Stormflow Surveys.....	7
3.0 PROCEDURES AND METHODOLOGY.....	7
3.1 Field Procedures.....	7
3.2 Laboratory Procedures.....	18
3.3 Data Storage.....	19
3.4 Quality Control.....	19
4.0 RESULTS AND DISCUSSION.....	24
4.1 Baseflow Survey.....	24
4.2 Stormflow Surveys.....	32
4.3 Quality Control.....	40
REFERENCES.....	45
APPENDIX I - Baseflow Survey Results	
APPENDIX II - Stormflow Survey Results - First Storm	
APPENDIX III - Stormflow Survey Results - Second Storm	
APPENDIX IV - Quality Control	

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1 Baseflow Water Quality Survey - Sampling Site Descriptions..	5
2 Baseflow Analyses.....	6
3 Stormflow Sampling Locations and Equipment Descriptions.....	9
4 Stormflow Analyses.....	10
5 Stormflow Surveys - PS 69 Automatic Water Samplers - Operation Data.....	13
6 Stormflow Surveys - Fixed-Stage Water Samplers - Operation Data.....	13
7 Baseflow Survey - Criteria and Selected Data for Chemical and Physical Parameters in Water.....	25
8 Baseflow Survey - Field, Physical, Aluminum, Hardness, and Nutrient Analyses Results.....	26
9 Baseflow Survey - Metal Concentrations Exceeding Standards, Criteria or Background Levels.....	29
10 Baseflow Survey - Maximum Concentrations of Significant Radioisotopes and Applicable Standards and Background Levels.....	30
11 Stormflow Sampling - Physical Characteristics of Suspended Sediment.....	36
12 Stormflow Sampling - Physical Characteristics of Bedload Sediment.....	37
13 Stormflow Surveys - Maximum Concentrations of Significant Radioisotopes in Water Samples and Applicable Standards and Background Levels.....	41

## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Baseflow Survey - Sampling Locations.....	4
2	Stormflow Survey - Sampling Locations.....	8
3	Hydrographs for Rated Streamflow Stations.....	33

## TASK 1

### WATER SAMPLING AND ANALYSIS INSTREAM CONTAMINANT STUDY

#### 1.0 INTRODUCTION

On November 3, 1983, the Oak Ridge Task Force under direction of the Tennessee Division of Water Management, approved conceptual workplans prepared by four subgroups of the Task Force. These workplans addressed potential offsite contamination problems associated with the Department of Energy (DOE) facilities near Oak Ridge, Tennessee. The conceptual workplans were transmitted to DOE on November 14, 1983. DOE subsequently authorized the Tennessee Valley Authority (TVA) to prepare a technical workplan covering the instream water, sediment, fish, and floodplain sampling approved by the Task Force (1). The Instream Contaminant Study workplan was submitted to DOE in February of 1984 and the work authorized by Interagency Agreement No. DE-AI05-84OR21444, TVA Contract No. TV-64095A, between DOE and TVA, and approved by the TVA Board of Directors on April 30, 1984.

This is the first of five task reports on the Instream Contaminant Study. It presents the results of field measurements, sample collections, and laboratory analyses of surface waters downstream of the DOE facilities. Included are the results of one baseflow survey and two storm event surveys conducted from May through November 1984. Sampling of a third storm was conducted on April 5 and 6, 1985. The results of this storm event survey will be reported in the Task 3 report (Sediment Transport).

The Task 1 report presents the water data collected and the procedures for collecting, handling, and analyzing the samples. Results are summarized in graphs and tables that include available criteria, standards, and background levels. The procedures and data are discussed for clarification, but the implications of the data have not been assessed. All data are presented in Appendices I, II, and III.

#### 1.1        PURPOSE

The purpose of Task 1 of the Instream Contaminant Study is to define the hydrologic characteristics and mercury concentrations in East Fork Poplar Creek and Bear Creek for sediment transport predictions. A limited number of water quality samples were collected to determine the presence of other contaminants which might be added to ongoing monitoring programs. Flow measurements were made and/or water samples collected from the Clinch River, East Fork Poplar Creek, Bear Creek, Poplar Creek, and lower White Oak Creek during one baseflow condition and from East Fork Poplar Creek, Bear Creek, and Mill Branch during two stormflow conditions. The results of a third stormflow survey conducted April 5 and 6, 1985, will be reported in the Task 3 report.

#### 1.2        SCOPE

The baseflow survey consisted of field measurements and sample collections at nine stations: Clinch River Miles (CRM) 24.0, 23.0, 15.0, 10.0, and 6.8; East Fork Poplar Creek Mile 14.36; Bear Creek Mile 7.4; White Oak Creek Mile 0.4; and Poplar Creek Mile 13.8. Six of these stations were

included in the interagency agreement approved April 30, 1984. Three stations (CRM 24.0 and 6.8, and Poplar Creek Mile 13.8) were added in May of 1984 to provide supplemental data requested by the Oak Ridge National Laboratory (ORNL). Baseflow field measurements included dissolved oxygen (DO), temperature, pH, conductivity, alkalinity, and water level. Laboratory analyses included selected metals, nutrients, priority pollutants, oil and grease, solids, turbidity, hardness, and radiological parameters (1).

The stormflow surveys involved sampling and laboratory analyses of mercury, suspended solids, turbidity, particle size distribution, specific gravity, and radiological parameters. Streamflow and precipitation data were also collected during each stormflow survey. Stormflow sampling stations were located at East Fork Poplar Creek Miles 14.36, 10.0, 6.8, 3.3, and 0.03; Mill Branch Mile 0.2 (a tributary to East Fork Poplar Creek); and Bear Creek Mile 0.55.

## 2.0 SAMPLING STATIONS AND PARAMETERS

### 2.1 BASEFLOW WATER QUALITY SURVEY

The location and description of each baseflow sampling station are given in Table 1 and shown in Figure 1. Table 2 lists the laboratory and field parameters which were analyzed, the total number of analyses, and the

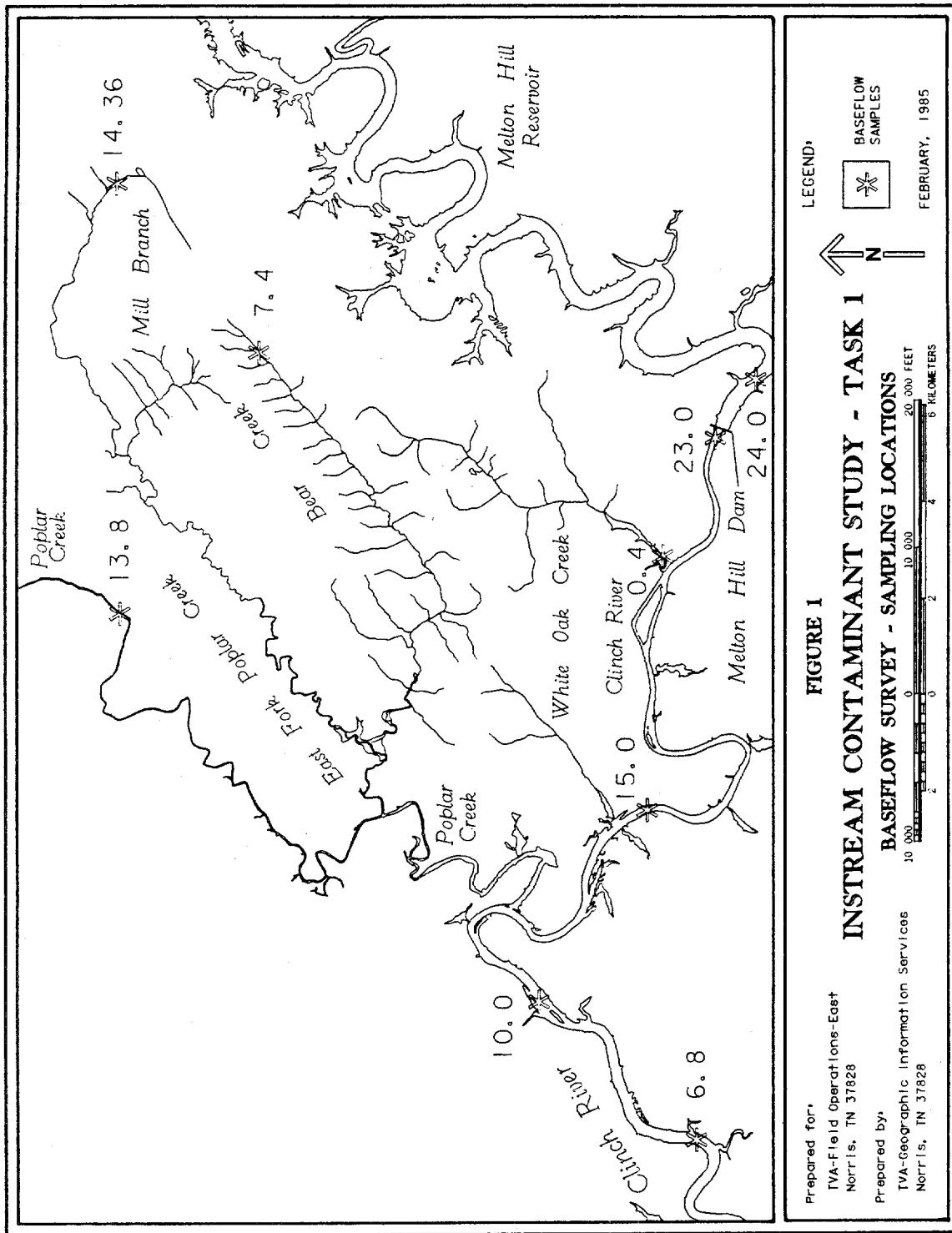


TABLE 1

INSTREAM CONTAMINANT STUDY - TASK 1  
BASEFLOW WATER QUALITY SURVEY - SAMPLING SITE DESCRIPTIONS

Stream	Mile	Description
East Fork Poplar Creek	14.36	Below New Hope Pond diversion point into East Fork Poplar Creek
Bear Creek	7.40	Upstream of eastern most gate to landfill areas on north side of Bear Creek Valley Road
White Oak Creek	0.40	Downstream of weir
Clinch River	23.00	Immediately below Melton Hill Dam
Clinch River	15.00	Between White Oak Creek and Poplar Creek
Clinch River	10.00	Downstream of Poplar Creek
Clinch River	6.80 <sup>1</sup>	Watts Bar Reservoir
Clinch River	24.00 <sup>1</sup>	Melton Hill Reservoir, immediately above Melton Hill Dam
Poplar Creek	13.80 <sup>1</sup>	Below Indian Creek near USGS stream gage

<sup>1</sup> Stations added as a supplement to the original interagency agreement.

TABLE 2  
INSTREAM CONTAMINANT STUDY - TASK 1  
BASEFLOW ANALYSES

Parameter	Number of Analyses	Number of Duplicate Analyses
<b>Field Analyses</b>		
Dissolved Oxygen	4	0
Temperature	4	0
pH	4	0
Conductivity	4	0
Alkalinity	6	1
Reservoir Profile <sup>2</sup> (DO, temp., pH, and conductivity)	2	0
Stream Stage	3	0
<b>Laboratory Analyses</b>		
Turbidity	4	1
Total Suspended Solids	4	1
Total Volatile Suspended Solids	3	1
Hardness	3	1
Nutrients:		
(a) NH <sub>3</sub> -N	3	1
(b) NO <sub>2</sub> +NO <sub>3</sub> -N	3	1
(c) Total Kjeldahl N	3	1
(d) Total P	3	1
Oil and Grease		
Priority Pollutants:		
(a) Volatile Organics	3	1
(b) Base/Neutral Compounds	3	1
(c) PCBs	3	1
(d) Cyanide	3	1
(e) Total Phenol	3	1
Priority Pollutant Metals (As, Be, Cd, Cr, Cu, Pb, Tl, Ni, Ag, Zn, Sb, Se):		
(a) Total	6	1
(b) Dissolved	3	0
Radiological Analyses		
(a) Gross Alpha	6	1
(b) Gross Beta	6	1
(c) Gamma Spectroscopy	6	1
(d) Tritium ( <sup>3</sup> H)	6	1
(e) Sr 90, Pu 238 and 239, Tc 99, Np 237, Th 232 and 228, U 238, 234 and 235	1	0
Lithium	3	1
Aluminum	3	1
Mercury:		
Total	7	1
Dissolved	7	1

<sup>1</sup>Number does not include duplicate analyses.

<sup>2</sup>Reservoir profiles of DO, temperature, pH, and conductivity were measured in situ using a HYDROLAB System 8000 field monitor.

<sup>3</sup>Analyses performed by ORNL.

duplicate analyses conducted for each parameter. All samples were collected at surface depth except at Clinch River Miles (CRM) 24.0 and 6.8 which were sampled at depths of 7 and 5 meters, respectively.

## 2.2 STORMFLOW SURVEYS

The location and description of the seven stormflow sampling stations are given in Table 3 and shown in Figure 2. Also given in Table 3 are the types of sampling and stream gaging equipment used at each location. Table 4 lists the parameters which were analyzed for both the first and second storm events. Also given are the different sample collection methods associated with each parameter and the total number of samples analyzed.

## 3.0 PROCEDURES AND METHODOLOGY

### 3.1 FIELD PROCEDURES

All water samples were obtained in accordance with applicable sample collection, handling, and preservation procedures as described in the TVA Field Operations Natural Resource Engineering Procedures Manual (2).

#### 3.1.1 BASEFLOW SURVEY

The baseflow water quality survey was conducted on May 30-31, 1984. The Clinch River sampling stations were sampled on May 30; all other locations were sampled on May 31.

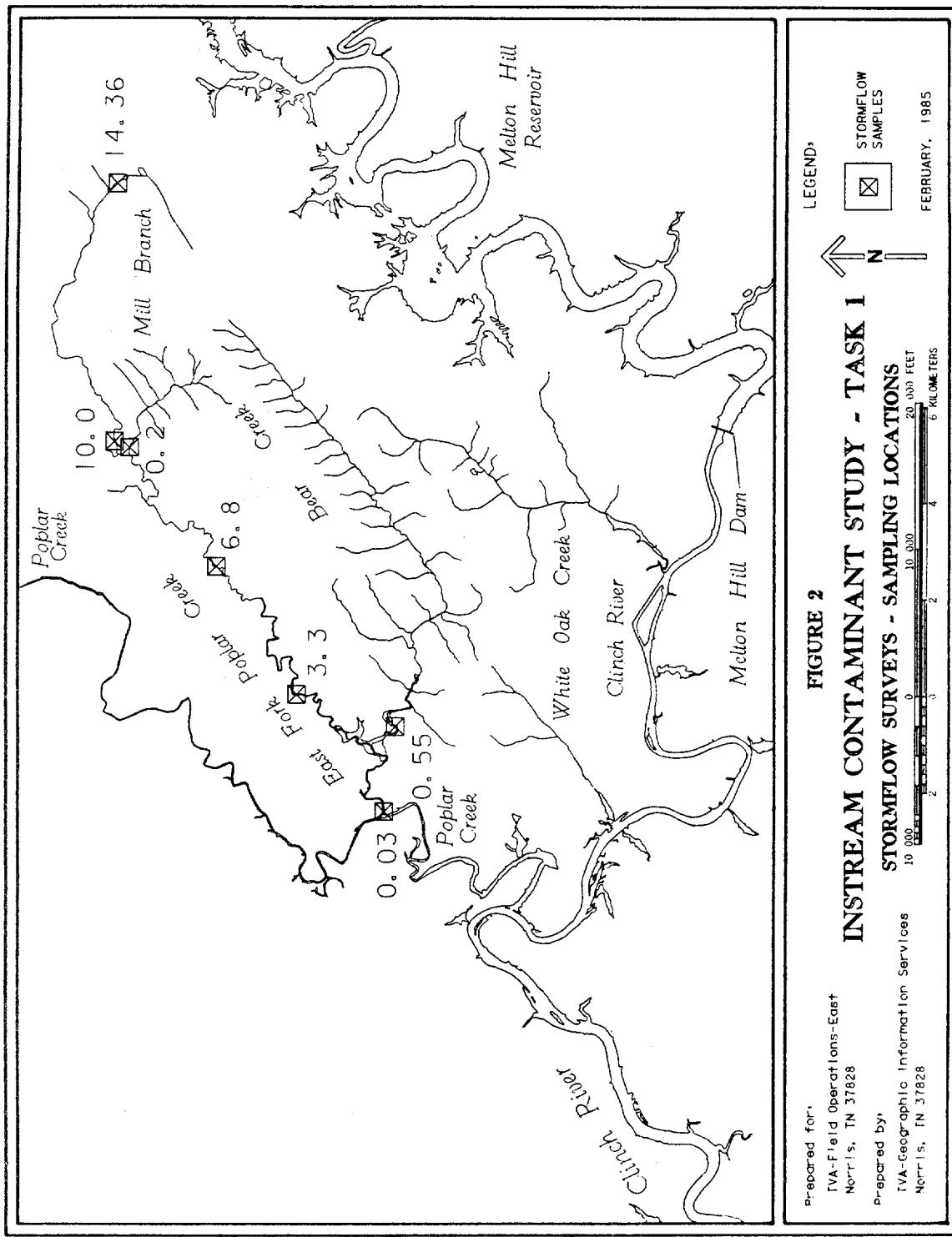


TABLE 3

INSTREAM CONTAMINANT STUDY - TASK 1  
STORMFLOW SAMPLING LOCATIONS AND EQUIPMENT DESCRIPTIONS

Stream	Mile	Site	Description	Equipment Used
East Fork Poplar Creek	14.36	Below New Hope Pond division point into East Fork Poplar Creek	PS 69 automatic water sampler, FW-2 stream gage recorder and staff gage. Depth integrated sampler.	
East Fork Poplar Creek	10.0	Upstream of Wiltshire Drive bridge	Same as EFPCM 14.36 plus bedload sampler.	
East Fork Poplar Creek	6.8	Downstream of Gum Hollow Road bridge at Oak Ridge Country Club Golf Course	FW-2 stream gage recorder and staff gage. Depth integrated and fixed stage water samplers.	
East Fork Poplar Creek	3.3	USGS Gaging Station	Same as EFPCM 10.0 plus USGS stream gage.	
East Fork Poplar Creek	0.03	Upstream of confluence with Poplar Creek	FW-2 stream gage recorder and staff gage. Depth integrated water sampler.	
Mill Branch	0.2	Upstream 1000' of confluence with East Fork Poplar Creek	Same as EFPCM 6.8.	
Bear Creek	0.55	Upstream from the influence from East Fork Poplar Creek backwater	Same as EFPCM 14.36.	

TABLE 4

INSTREAM CONTAMINANT STUDY - TASK 1  
STORMFLOW ANALYSES

Parameter	Sample Collection Method	Number of Analyses <sup>1</sup>	
		Storm #1	Storm #2
Total Suspended Solids	Automatic PS 69	19	31
	Manual-Depth Integ.	36	37
	Fixed Stage	0	4
	Time Composite	4	5
	TOTAL	59	77
Total Volatile Suspended Solids	Automatic PS 69	19	31
	Manual-Depth Integ.	0	0
	Fixed Stage	0	4
	TOTAL	19	35
Turbidity	Automatic PS 69	19	31
	Manual-Depth Integ.	6	0
	Fixed Stage	0	4
	TOTAL	25	35
Mercury (Total and Dissolved)	Automatic PS 69	18	27
	Manual-Depth Integ.	6	0
	TOTAL	26	27
Radiological Analyses (Gross Alpha, Gross Beta, Gamma Spectroscopy)	Grab	4	4
Suspended Sediment Particle Size Analyses (mg/L greater than 62, 125, 500, and 2,000 micrometers and total suspended solids)	Time Composite	7	7
Suspended Sediment Specific Gravity	Time Composite	7	7
Bedload Particle Size Analyses (percent finer than 0.25 in., and 2,000, 500, 125, and 62 micrometers)	Spatial Composite	4	4
Bedload Specific Gravity	Spatial Composite	4	4
Streamflow	FW-2 Stream Gage Recorder and Staff Gage	Continuous Record	Continuous Record

<sup>1</sup>Number of analyses does not include duplicate analyses.

Samples for nitrate+nitrite nitrogen analyses were recollected at Bear Creek Mile 7.4 on June 26 after laboratory analyses of the May 31 sample revealed a nitrate+nitrite nitrogen concentration of 240 mg/L as N. The June 26 sample had a concentration of 380 mg/L. Samples for cyanide and total phenols analyses were recollected on September 9 at all locations due to inadequate sample preservation.

All samples were collected at mid-channel and surface depth except at Clinch River Miles 24.0 and 6.8 where samples were collected at mid-depth in the reservoir and at White Oak Creek Mile 0.4 which was sampled on the left bank. Dissolved oxygen (DO), pH, temperature, and conductivity were measured in situ using a HYDROLAB System 8000 field monitor. These measurements were made as reservoir profiles at Clinch River Miles 24.0 and 6.8 by taking measurements at the surface, at one meter increments to ten meters depth, and at three meter increments from ten meters to the reservoir bottom.

### 3.1.2      STORMFLOW SURVEYS

#### 3.1.2.1    EQUIPMENT INSTALLATION AND DESCRIPTION

As part of a separate interagency agreement with DOE, TVA conducted planning sessions and field inspections to select stormflow sampling sites and equipment for each site.

As part of the Instream Contaminant Study, twenty flow measurements were made at the selected sampling sites to develop flow rating curves for each location where stream gages were to be installed. Stream gaging stations, including FW-2 streamflow recorders, stilling wells, gage houses, walkways, and staff gages were then installed at the sites. Stream gage installation was completed in May 1984.

The PS 69 automatic water sampler which was used to collect stormwater samples for suspended sediment and total and dissolved mercury analyses was installed in 8 feet by 10 feet portable buildings at four sites (Table 3). The sampler intake lines were anchored in the stream at a 45 degree angle downstream, with the intake openings cut parallel to the flow. Operation of the samplers was initiated automatically during a storm event by float switches mounted in the stream at preset stages. After initiation of sampling, the PS 69 samplers collected samples at preset time intervals over the duration of the storm event. Each sampler was tied electrically to a sampling event marker on a FW-2 streamflow recorder at each station to indicate when each sample was collected. The sampling intervals were adjusted, as necessary, during a storm event to best cover the event period. Table 5 lists the initial sampling stage at which the float switches were set, the intake location, and the sampling intervals for each PS 69 sampling station. Installation of the PS 69 samplers was completed in July 1984.

TABLE 5

INSTREAM CONTAMINANT STUDY - TASK 1  
STORMFLOW SURVEYS - PS 69 AUTOMATIC WATER SAMPLERS -  
OPERATION DATA

Stream	Mile	Sampling Interval (Min)	Initial Sampling Stage (Ft)	Intake Location
East Fork Poplar Creek	14.36	5.60	0.40	1/2' off creek bed 12' from right waters edge. (RWE)
East Fork Poplar Creek	10.0	5.60	1.00	3/4' off creek bed 12' from RWE
East Fork Poplar Creek	3.3	11.25	2.00	3/4' off creek bed 19' from RWE
Bear Creek	0.55	11.25	0.60	3/4' off creek bed 15' from RWE

<sup>1</sup>Adjusted in the field to obtain representative samples across the storm hydrograph.

<sup>2</sup>Stage refers to corresponding reading on the station staff gage.

TABLE 6

INSTREAM CONTAMINANT STUDY - TASK 1  
FIXED-STAGE WATER SAMPLERS - OPERATION DATA

Stream	Mile	Staff Gage Reading of Sampler Intakes (Ft)	Stream Bank of Sampler
East Fork Poplar Creek	6.8	1.5, 2.5, 3.5 4.0, 4.5, 5.0	Right
Mill Branch	0.2	1.25, 1.75, 2.00 2.25, 2.50	Left

Fixed-stage water samplers which were used for collecting suspended sediment samples were installed at two sites (Table 3). These samplers consisted of wooden frames which were anchored in the streambed. Sample bottles were mounted on the frames with intakes at fixed elevations. Samples were collected during a storm event as the stream stage rose to the level of the bottle intake. Table 6 lists the sample intake stages for each fixed-stage water sampler and its location in the stream channel.

Depth integrated samplers were used at all sites for collecting suspended sediment samples. These samplers were operated manually by placing a sample bottle inside the sampler and lowering the sampler into the stream to a depth near the channel bottom and then retrieving the sampler. As the sampler was lowered and retrieved, water filled the sample bottle through an intake opening in the sampler. Fins on the sampler ensured that the sampler intake was pointed upstream as the sample bottles were filled.

A bedload sampler was used at two sites for collecting bedload sediment. The sampler consisted of a metal frame with a rectangular inlet to which a fabric bedload bag was attached. The sampler was lowered using an electric winch to the channel bottom with the inlet directed upstream. The bedload bag was allowed to fill with sediment for ten minutes. The sampler was then retrieved and the contents removed and placed in plastic bags.

Precipitation data were collected using a Belfort recording rain gage installed in the Bear Creek basin near Bear Creek Mile 3.0. Installation of this rain gage was completed in August 1984. Additional rainfall data were collected by a private rainfall observer.

### 3.1.2.2 STORM EVENT SAMPLING

Sampling of the first storm event was conducted on October 22-23, 1984. Rainfall began at approximately 7 a.m. on October 22 and ended at approximately 6 p.m. on October 23. Samples were collected from 5 p.m. on October 22 to 6 a.m. on October 23. The criteria for initiation of the storm event was a minimum of one inch of rainfall. The criteria for ending the storm event was recession of the creek stage at East Fork Poplar Creek Mile 3.3 to a predetermined level as measured by the station FW-2 streamflow recorder. Rainfall intensity was not constant over the duration of the event but consisted of periods of intense rainfall followed by periods of moderate to no rainfall. Total rainfall during the storm event was 2.0 inches.

Sampling of the second storm event was conducted on November 10-11, 1984. Rainfall began at approximately 11 a.m. on November 10 and ended at approximately 6 p.m. on the same day. Samples were collected from 1 p.m. on November 10 to 2 a.m. on November 11. The stormflow survey was initiated when rains were sufficient to maintain a stream stage of 0.70 feet at East Fork Poplar Creek Mile 14.36. The criteria for ending

the storm event was identical to that used for the first storm event.

Rainfall intensity was similar to the first storm event and totaled 1.4 inches.

The PS 69 samples were removed from the sampler following the storm event. Samples collected at various times over the rising limb, peak, and receding limb of the hydrograph were selected for analysis (i.e., mercury, TSS, TVSS, and turbidity--Table 4). During the first storm event, the PS 69 sampler at East Fork Poplar Creek Mile 14.36 experienced a pump motor malfunction as the storm event began. Depth integrated samples were collected hourly to replace those from the inoperative PS 69 sampler. These samples were used for the analyses of all required parameters except radioactivity which was collected as a discrete grab sample.

Fixed-stage samples were collected at EFPCM 6.8 and Mill Branch Mile 0.20 during both storm events. Only samples for the second storm event were analyzed, however, since sufficient samples during the first storm event were collected using the depth integrated sampler. The fixed-stage samples were removed from the sampler after recession of the stormflow and poured into appropriate sample containers.

Depth integrated samples for total suspended solids analyses were collected at all stations during the stormflow surveys. These samples were collected at three to five predetermined points across the stream and

composited in a one-gallon sampler container. At sites where PS 69 samplers were located (Table 3), depth integrated samples were collected at a minimum of three times over the duration of the storm event: once on the rising limb of the hydrograph, once near the peak, and once during the recession of stormflow. At sites with no PS 69 samplers, hourly depth integrated samples were collected. Samples for particle size analyses of suspended sediment were obtained by compositing equal volumes from the depth integrated samples collected at a site.

Bedload samples were collected at EFPCM 3.3 and 10.0 (Table 3). These samples were taken at five points across the stream and composited in a plastic bag. Two composite samples were collected for each storm event. The first composite sample was collected in a traverse from the left bank of the stream to the right. The second composite was collected in a traverse from the right to left bank.

Radiological samples were collected once during each storm event at EFPCM 14.36, 10.0, 3.3, and Bear Creek Mile 0.55. Six-liter grab samples were collected at mid-channel near the peak of the streamflow.

All samples for laboratory analyses were processed (e.g., filtration, preservation) and shipped on ice to the TVA Laboratory Branch in Chattanooga or to the TVA Western Area Radiological Laboratory (WARL) in Muscle Shoals.

### 3.2 LABORATORY PROCEDURES

#### 3.2.1 SAMPLE COLLECTION, SHIPPING, AND RECEIVING

Samples were collected and shipped along with field data sheets to the TVA Laboratory Branch in Chattanooga or to the TVA Western Area Radiological Laboratory (WARL) in Muscle Shoals (Appendix IV - Figure 1). Upon receipt in the laboratory, samples were inventoried, irregularities noted, and the samples logged into the computer system. Blind laboratory duplicates were prepared by splitting thoroughly homogenized samples. These split samples were also logged into the computer system.

#### 3.2.2 LABORATORY ANALYSES AND DATA REPORTING

A flow chart showing laboratory and data reporting steps is given in Appendix IV - Figure 2. Samples and blanks were analyzed in accordance with standard TVA laboratory procedures (3). Specific references, type of analysis, and detection limits for the analytical procedures are listed in Appendix IV. The Laboratory Branch Intralaboratory Quality Control Program was followed by analyzing approximately ten percent of the samples in duplicate and, when possible, spiking ten percent of the samples.

Results from accuracy and precision quality control samples were plotted on control charts. If a result was outside the control limits, the samples were resubmitted for analyses.

All analytical data were recorded in laboratory notebooks, calculations checked, analysis approved, and results forwarded to the Quality Assurance Coordinator (QAC). The QAC summarized the blind laboratory and field duplicates along with the reference samples. If the data indicated a problem, corrective actions were taken. If possible, the samples were resubmitted for analysis.

The QAC compared the blind laboratory duplicates with the field duplicates. If there was a significant difference between the laboratory and field variability, the QAC notified the Project Manager of homogeneity problems. The QAC also "flagged" all questionable data with appropriate qualifying remarks.

### 3.3 DATA STORAGE

The QAC forwarded the approved data to the Task Leader who prepared a report of results which was submitted to data processing. The data were keypunched, verified, and stored on the EPA-STORET data system. Completed printouts of data were forwarded to the responsible Task Leader who reviewed the printout for reasonableness and approved final printout of data.

### 3.4 QUALITY CONTROL

A complete discussion of the TVA Quality Assurance Program is given in Reference 4.

### 3.4.1 INTRALABORATORY CONTROL CHARTS

#### 3.4.1.1 EVALUATION OF ACCURACY

Data for accuracy control charts were generated by analyzing actual samples spiked with known amounts of the analyte. The percent recovery was determined, and 100 percent was subtracted from the recovery to obtain the percent bias. Percent bias values were plotted on control charts that indicated upper and lower warning and control limits.

Warning and control limits for accuracy control charts were calculated from actual recovery data obtained from analysis of large batches of samples (nominally, at least 20 values). Using the individual percent bias values, the mean ( $\bar{x}$ ) and the standard deviation (SD) were calculated. Warning and control limits were established as  $\bar{x} \pm 1$  SD and  $\bar{x} \pm 2$  SD, respectively.

Two consecutive observations or repeated results outside the warning limits required an examination of the system to prevent it from going out of control. The analysis was judged "out of control" when any point fell outside the control limits. Standard policy was to reanalyze all samples determined during any period shown to be out-of-control.

### 3.4.1.2 EVALUATION OF PRECISION

Data for precision control charts were generated by analyzing actual samples in duplicate. The difference between the two values was multiplied by 0.89 to obtain the approximate standard deviation (3). The standard deviation multiplied by 100 divided by the mean of the duplicate values yielded the relative standard deviation in percent (percent RSD). The percent RSD values were plotted on control charts that indicate warning and control limits.

Warning and control limits for precision control charts were calculated from actual precision data obtained from analyses large batches of samples (nominally, at least 20 values). Using the individual relative standard deviation values, the mean ( $\bar{x}$ ) and standard deviation (SD) were calculated. Warning and control limits were established as  $\bar{x} + 1$  SD and  $\bar{x} + 2$  SD, respectively.

Two consecutive observations or repeated results outside the warning limit required corrective action. The analysis was judged out-of-control when any value fell outside the control limits. Standard policy was to reanalyze all samples determined during a period shown to be out-of-control.

### 3.4.2 REFERENCE SAMPLES

Standard reference materials supplied by National Bureau of Standards (NBS), Eastman Kodak Company, and Environmental Protection

Agency (EPA) were analyzed (when certified material was available) with each set of Oak Ridge samples. These results were used to provide a measure of the accuracy of the overall data set.

TVA's Western Area Radiological Laboratory (WARL) participates in twelve or more of the laboratory intercomparison studies conducted by EPA's Las Vegas laboratory. The results from this intercomparison are presented in the annual environmental operating reports for TVA's nuclear power plants. WARL also analyzes crosscheck samples produced by TVA's laboratory quality control program for nuclear radiochemical laboratories.

### 3.4.3 BLIND DUPLICATE SAMPLES

#### 3.4.3.1 BLIND FIELD DUPLICATES

Duplicate samples were periodically collected and shipped to the Laboratory Branch. These samples were inserted blind into the analytical stream along with the other samples. The relative standard deviation was calculated from these duplicate data as described in Section 3.4.1.2.

#### 3.4.3.2 BLIND LABORATORY DUPLICATES

The Quality Assurance Coordinator prepared a second aliquot from an original sample by splitting the sample after it had been thoroughly mixed. These samples were also inserted blind into the analytical stream. The relative standard deviation was calculated from these duplicate data as described in Section 3.4.1.2.

The WARL routinely checks radiochemical procedures by analyzing quality control samples comprising approximately 10 percent of the laboratory sample load. These quality control checks include blind laboratory duplicates, blanks, backgrounds, counting standards, work station routine spikes, blind spikes, and in-house crosschecks.

#### 3.4.4 EPA SPLIT SAMPLES

Approximately five percent of all sediment samples were thoroughly homogenized and a representative aliquot sent to the EPA Region IV Laboratory and/or the EPA Eastern Environmental Radiation Facility (EERL) for analysis of the same parameters analyzed on the original sample. EPA split samples were submitted incrementally throughout the project to ensure early detection and correction of any analytical problem. Interlaboratory split data were analyzed using percent relative error to determine if bias existed between the TVA and EPA laboratories. This procedure is as follows:

Percent relative error is defined as the difference between two replicate samples divided by the mean of the samples expressed as percent. It is calculated as follows:

$$\% \text{ Relative Error} = \frac{\{\text{EPA Result} - \text{TVA Result}\}}{\{\text{EPA Result} + \text{TVA Result}\}} \times 200$$

Percent relative error can vary only between -200 and +200. A helpful way of conceptualizing relative error is to consider its relationship to the ratio of the two laboratories. This relationship can be calculated as follows:

$$\text{Ratio} \frac{\text{EPA Result}}{\text{TVA Result}} = \frac{\{200 + \% \text{ relative error}\}}{\{200 - \% \text{ relative error}\}}$$

Representative values are as follows:

<u>Ratio</u>	<u>EPA Result</u>	<u>% Relative Error</u>	<u>Ratio</u>	<u>EPA Result</u>	<u>% Relative Error</u>
	<u>TVA Result</u>			<u>TVA Result</u>	
0	-200		$\infty$		200
0.01	-196		100		196
0.10	-164		10		164
0.20	-138		5		133
0.33	-100		3		100
0.50	-67		2		67
0.67	-40		1.5		40
0.83	-18		1.2		18

#### 4.0        RESULTS AND DISCUSSION

##### 4.1        BASEFLOW SURVEY

Analytical results are given in Appendix I. Available standards, criteria, and background data are summarized in Tables 7 and 10.

###### 4.1.1      GENERAL WATER QUALITY

The results of field analyses (DO, temperature, pH, conductivity, and alkalinity); physical analyses (turbidity and solids); and aluminum, hardness, and nutrient analyses are summarized in Table 8. Comparison of

TABLE 7

INSTREAM CONTAMINANT STUDY - TASK 1  
BASEFLOW SURVEY - CRITERIA AND SELECTED DATA FOR CHEMICAL AND PHYSICAL PARAMETERS IN WATER

Parameter (Units)	TN Source Standards <sup>1</sup>	EPA Drinking Water Standards <sup>2,3</sup>	Aquatic Life <sup>4</sup> 24 Hr Avg	Mean Concentrations of Tributary Streams to <sup>5</sup> Upper Tennessee River
<u>GENERAL WATER QUALITY</u>				
Temperature (°C)	30.0	-	- <sup>6</sup>	15.0
Dissolved Oxygen (mg/L)	-	-	5.0 <sup>6</sup>	8.8
pH (Standard Units)	6.9	6.5-8.5	6.5-9.0	-
Conductivity ( $\mu\text{mho}/\text{cm}$ )	-	-	-	192.0
Turbidity (NTU)	-	1.0	-	9.5
Total Suspended Solids (mg/L)	-	-	-	13.0
Volatile Suspended Solids (mg/L) <sup>10</sup>	-	-	-	-
Total Alkalinity (mg/L)	-	-	-	-
Total Hardness (mg/L as $\text{CaCO}_3$ )	-	-	-	126.0
Nitrate+Nitrite Nitrogen (mg/L)	10 (as $\text{NO}_3-\text{N}$ )	10 (as $\text{NO}_3-\text{N}$ )	- <sup>7</sup>	0.39
Ammonia Nitrogen (mg/L)	-	-	0.02 <sup>7</sup>	0.09
Total Kjeldahl Nitrogen (mg/L)	-	-	-	0.19
Total Phosphorus (mg/L)	-	-	-	0.04
Aluminum ( $\mu\text{g}/\text{L}$ )	-	-	-	761.0
Oil and Grease (mg/L)	-	-	-	6.0
Cyanides (mg/L)	200.0	-	3.5	52.0
<u>METALS</u>				
Antimony ( $\mu\text{g}/\text{L}$ ) <sup>10</sup>	-	-	-	-
Arsenic ( $\mu\text{g}/\text{L}$ )	50.0	50.0	40.0	440.0
Beryllium ( $\mu\text{g}/\text{L}$ )	-	-	5.3	130.0 <sup>8</sup>
Cadmium ( $\mu\text{g}/\text{L}$ )	10.0	10.0 <sup>9</sup>	0.025 <sup>8</sup>	3.0 <sup>9</sup>
Chromium ( $\mu\text{g}/\text{L}$ )	50.0	50.0 <sup>9</sup>	-	100.0 <sup>8</sup>
Copper ( $\mu\text{g}/\text{L}$ )	1,000.0	1,000.0	5.6 <sup>8</sup>	22.0 <sup>8</sup>
Lead ( $\mu\text{g}/\text{L}$ )	50.0	50.0	3.8	170.0 <sup>8</sup>
Lithium ( $\mu\text{g}/\text{L}$ )	-	-	-	<10.0
Mercury ( $\mu\text{g}/\text{L}$ )	0.2	2.0	0.2	4.1
Nickel ( $\mu\text{g}/\text{L}$ )	100.0	-	96.0 <sup>8</sup>	1,800.0 <sup>8</sup>
Selenium ( $\mu\text{g}/\text{L}$ )	10.0	10.0	35.0	260.0 <sup>8</sup>
Silver ( $\mu\text{g}/\text{L}$ )	50.0	50.0	-	4.1
Thallium ( $\mu\text{g}/\text{L}$ ) <sup>10</sup>	-	-	-	-
Zinc ( $\mu\text{g}/\text{L}$ )	5,000.0	5,000.0	47.0	320.0

<sup>1</sup>Tennessee Drinking Water Source Standards, 1983.

<sup>2</sup>National Interim Primary Drinking Water Standards, 40 CFR Part 141.

<sup>3</sup>National Secondary Drinking Water Standards, 40 CFR Part 143.

<sup>4</sup>EPA Water Quality Criteria for the Protection of Aquatic Life. Criteria listed are from EPA's Quality Criteria for Water (1976) ("Red Book") and from EPA's 1980 Water Quality Criteria for Priority Pollutants (see 45 FR 79318-79341, November 28, 1980).

<sup>5</sup>Average concentrations in water for streams tributary to the Tennessee River between miles 424 and 652; 43 sampling locations - 1960 to 1983, TVA STORET data.

<sup>6</sup>The 5.0 mg/L criteria for dissolved oxygen is a minimum value rather than a 24-hour average.

<sup>7</sup>0.02 as unionized ammonia. See EPA's 1976 Quality Criteria for Water, p. 16 for further explanation.

<sup>8</sup>Values calculated for a hardness of 100 mg/L using the equations given in 45 FR 79318-341. Increasing hardness generally decreases toxicity of these metals.

<sup>9</sup>National Interim Primary Drinking Water Standard is 50  $\mu\text{g}/\text{L}$  for hexavalent chromium ( $\text{Cr}^{+6}$ ). The criteria listed for aquatic life, irrigation, and livestock are for total chromium, which was the species measured in this study.

<sup>10</sup>No applicable criteria available.

TABLE 8

INSTREAM CONTAMINANT STUDY - TASK 1  
BASEFLOW SURVEY - FIELD, PHYSICAL, ALUMINUM, HARDNESS, AND NUTRIENT ANALYSES RESULTS

Parameter (Units)	East Fork Poplar Creek Mile 14.36	Bear Creek Mile 7.4	White Oak Creek Mile 7.4	Poplar Creek Mile 13.8	Clinch River Mile 24.0	Clinch River Mile 6.8
Temperature (°C)	22.4	17.0	17.6	14.0	15.5 <sup>1</sup>	14.7 <sup>1</sup>
Dissolved Oxygen (mg/L)	8.3	9.3	6.2	9.2	12.3 <sup>1</sup>	11.1 <sup>1</sup>
pH (Standard Units)	8.1	7.9	7.4	7.7	8.3 <sup>2</sup>	7.7 <sup>2</sup>
Conductivity (µmhos/cm)	454.0	>2000.0	395.0	230.0	280.0 <sup>1</sup>	-
Alkalinity (mg/L as CaCO <sub>3</sub> )	115.0	176.0	110.0	49.0	96.0	-
Turbidity (NTU)	3.5	1.6	22.0	-	-	-
Total Suspended Solids (mg/L)	5.0	2.0	18.0	-	-	-
Total Volatile Suspended Solids (mg/L)	2.0	2.0	3.0	-	-	-
Hardness (mg/L as CaCO <sub>3</sub> )	170.0	1000.0	160.0	-	-	-
Aluminum (µg/L)	60.0	140.0	205.0	-	-	-
Organic Nitrogen (mg/L)	0.57	0.21	0.29	-	-	-
Total Ammonia Nitrogen (mg/L)	0.11	0.17	0.13	-	-	-
Unionized Ammonia Nitrogen (mg/L)	0.007	0.005	0.001	-	-	-
Nitrate+Nitrite Nitrogen (mg/L)	3.8	240.0	0.83	-	-	-
Total Phosphorus (mg/L)	0.66	<0.01	0.18	-	-	-

<sup>1</sup>Mean values from a reservoir profile.

<sup>2</sup>Maximum values in a reservoir profile.

these data with Table 7 indicates that most data are within the range of existing standards, criteria, and background levels. Nitrate+nitrite nitrogen concentrations at Bear Creek Mile 7.4 are excessive with values of 240 mg/L and 380 mg/L. During the sampling periods activities were underway at Y-12 to neutralize the S-3 ponds and contain future releases. Hardness and conductivity at Bear Creek Mile 7.4 were also in excess of background data with values of 1000 mg/L as CaCO<sub>3</sub> and greater than 2000 µhos/cm, respectively. Conductivity at East Fork Poplar Creek Mile 14.36, White Oak Creek Mile 0.4, and Clinch River Mile 24.0 were in excess of background data with values of 454, 395, and 280 µhos/cm, respectively. Turbidity and suspended solids at White Oak Creek Mile 0.4 exceeded background data with values of 22 NTU for turbidity and 18 mg/L for suspended solids (mean values of duplicate samples).

#### 4.1.2 PRIORITY POLLUTANT ORGANICS

Analyses for priority volatile organics, acid extractables, base/ neutrals, pesticides, and PCBs indicated that none of these compounds were present above the analytical detection limits and no evidence of their presence below the detection limit was shown. Total phenols were detected at Bear Creek Mile 7.4 and White Oak Creek Mile 0.4 with values of 6 mg/L and 3 mg/L (mean value of duplicate samples) at each station, respectively. No standards or background data are available for comparison, however. All results are reported in Appendix I - Table 1 by reporting the detection

limit value followed by a "U" indicating no evidence of the parameter below the detection limit, or by a "M" indicating evidence of parameter presence below the detection limit that could not be quantified.

#### 4.1.3      OIL AND GREASE AND CYANIDE

Oil and grease and cyanide were below detection limits in all samples. Results are presented in Appendix I - Table 1 by reporting the detection limit value followed by a "U" indicating no evidence of the parameter at the detection limit.

#### 4.1.4      METALS

Results of metal analyses (Appendix I - Table 1) show that most metal concentrations were below detection limits and/or available standards and background data. Exceptions are given in Table 9. Values which substantially exceeded background concentrations were total mercury at East Fork Poplar Creek Mile 14.36 with a concentration of 2.5 µg/L and total cadmium at Bear Creek Mile 7.4 with a concentration of 26 µg/L.

#### 4.1.5      RADIOLOGICAL PARAMETERS

A total of seven surface water samples including one field duplicate were collected during the baseflow survey for radiological analyses (Appendix I - Table 1). In addition, one sample was collected for analyses of transuranics and other radionuclides (Table 2) by ORNL. A summary of the significant results are given in Table 10 along with the applicable drinking water standards as outlined in 40 CFR 141. Maximum

TABLE 9  
 INSTREAM CONTAMINANT STUDY - TASK 1  
 BASEFLOW SURVEY - METAL CONCENTRATIONS EXCEEDING STANDARDS, CRITERIA, OR BACKGROUND LEVELS

Parameter (Units)	Poplar Creek Mile 14.36	East Fork Bear Creek Mile 7.4	White Oak Creek Mile 0.4	Clinch River Mile 24.0
Total Mercury ( $\mu\text{g/L}$ )	2.5	-	<0.3 <sup>1</sup>	0.3
Total Cadmium ( $\mu\text{g/L}$ )	-	26.0	-	-
Total Chromium ( $\mu\text{g/L}$ )	-	-	9.0 <sup>1</sup>	-
Total Copper ( $\mu\text{g/L}$ )	-	15.0	-	-
Total Lithium ( $\mu\text{g/L}$ )	30.0	-	-	-
Total Nickel ( $\mu\text{g/L}$ )	-	69.0	-	-
Total Zinc ( $\mu\text{g/L}$ )	60.0	-	-	-

<sup>1</sup>Means value of field duplicate samples.

TABLE 10

INSTREAM CONTAMINANT STUDY - TASK 1  
 BASEFLOW SURVEY - MAXIMUM CONCENTRATIONS OF SIGNIFICANT RADIOSOTOPES IN  
 WATER SAMPLES AND APPLICABLE STANDARDS AND BACKGROUND LEVELS

Isotope	LLD <sup>1</sup> (pCi/L)	Standards and Background Levels (pCi/L)			Concentrations of Significant Isotopes - Baseflow Survey <sup>5</sup> (pCi/L)		
		Drinking Water Standard <sup>2</sup>	MPC <sup>3</sup>	Tenn. River	White Oak Creek	Bear Creek	Clinch River
Gross Alpha	2.0	15	30	4.0	11 (36%)	31 (103%)	3 (10%)
Gross Beta	2.4	— <sup>6</sup>	3,000	9.6	690 (23%)	330 (11%)	4 (0.1%)
Tritium	330.0	20,000	3,000,000	712.0	544,000 (18%)	500 (0.02%)	500 (0.02%)
Cs-137	5.0	— <sup>6</sup>	20,000	— <sup>7</sup>	68 (0.34%)	— <sup>7</sup> (0.02%)	— <sup>7</sup> (0.01%)
Co-60	5.0	— <sup>6</sup>	30,000	— <sup>7</sup>	19 (0.06%)	— <sup>7</sup>	— <sup>7</sup>
Sr-90	— <sup>8</sup>	— <sup>6</sup>	300	— <sup>8</sup>	— <sup>8</sup>	— <sup>8</sup>	0.6 (0.2%)

<sup>1</sup> Lower limit of detection as calculated by the method developed by Pasternack and Harley and described in HASL-300 and Nuclear Instruments Methods 91, 533-40 (1971).

<sup>2</sup> Interim Primary Drinking Water Regulations as outlined in 40 CFR 141.

<sup>3</sup> Maximum Permissible Concentrations (MPC) recommended by 10 CFR 20 for nonoccupational exposure.

<sup>4</sup> Maximum concentrations reported by TVA in the Tennessee River samples collected in 1981-83.

<sup>5</sup> The percentage of the MPC value is reported in parenthesis.

<sup>6</sup> No standard available.

<sup>7</sup> Isotope not identified in gamma spectral analyses.

<sup>8</sup> Analysis not performed.

permissible concentrations (MPCs) recommended by 10 CFR 20 for nonoccupational exposure are included for comparative purposes, although the MPCs apply only to facilities licensed by the Nuclear Regulatory Commission. The maximum concentrations reported by TVA in water samples collected from the Tennessee River from 1981 to 1983 are also presented for comparison.

Tritium concentrations were by far the most significant of any isotope identified in surface water samples. The maximum concentration reported in White Oak Creek is approximately 75 times the maximum levels reported in the Tennessee River and is 18 percent of the MPC. Concentrations reported in other streams did not exceed the maximum concentration previously observed in the Tennessee River. Only two other radioisotopes were identified and both were found in White Oak Creek. Cesium 137 and cobalt 60 levels in White Oak Creek were less than 1 percent of the MPC. Only one concentration exceeded the corresponding MPC (i.e., the gross alpha concentration at Bear Creek Mile 7.4 which exceeded the MPC by 3 percent). All transuranic isotopes were substantially below MPC levels.

In summary, the highest radiological levels were found in White Oak Creek with concentrations in the Clinch River and East Fork Poplar Creek generally corresponding to levels reported in the Tennessee River. Elevated in gross alpha and gross beta activity were observed in Bear Creek.

#### 4.2 STORMFLOW SURVEYS

Results for the first and second stormflow surveys are given in Appendices II and III, respectively. These data were collected for calibration of a sediment transport model to be presented in the Task 3 report. The following discussion compares the mercury and radiological concentrations during the two storm events with available standards and criteria. Streamflow, suspended sediment, and bedload data are examined relative to their potential impact on sediment transport. The results of a third storm event survey conducted on April 5-6, 1985, will be discussed in the Task 3 report.

##### 4.2.1 STREAMFLOW

Figure 3 presents hydrographs for the rated stations during the first and second storm events. A hydrograph for East Fork Poplar Creek Mile 0.03 was not obtained due to the pool effects of Watts Bar Reservoir. Detailed (expanded scale) plots of each hydrograph and the water levels at East Fork Poplar Creek Mile 0.03 are given in Figure 1 of Appendices II and III. An anomaly apparently exists between the hydrograph for East Fork Poplar Creek 3.3 and the upstream stations. Peak flows at mile 3.3 were significantly less than the peak flows at mile 6.8 for both storm events. An investigation of this occurrence is in progress.

##### 4.2.2 PHYSICAL CHARACTERISTICS OF SUSPENDED SEDIMENT AND BEDLOAD

Specific gravity and particle size results for the 14 suspended sediment and 8 bedload sediment samples collected during the two storm events

FIGURE 3(a)  
**HYDROGRAPHS FOR RATED STATIONS**  
OCT 84 OAK RIDGE IN-STREAM CONTAM. STUDY

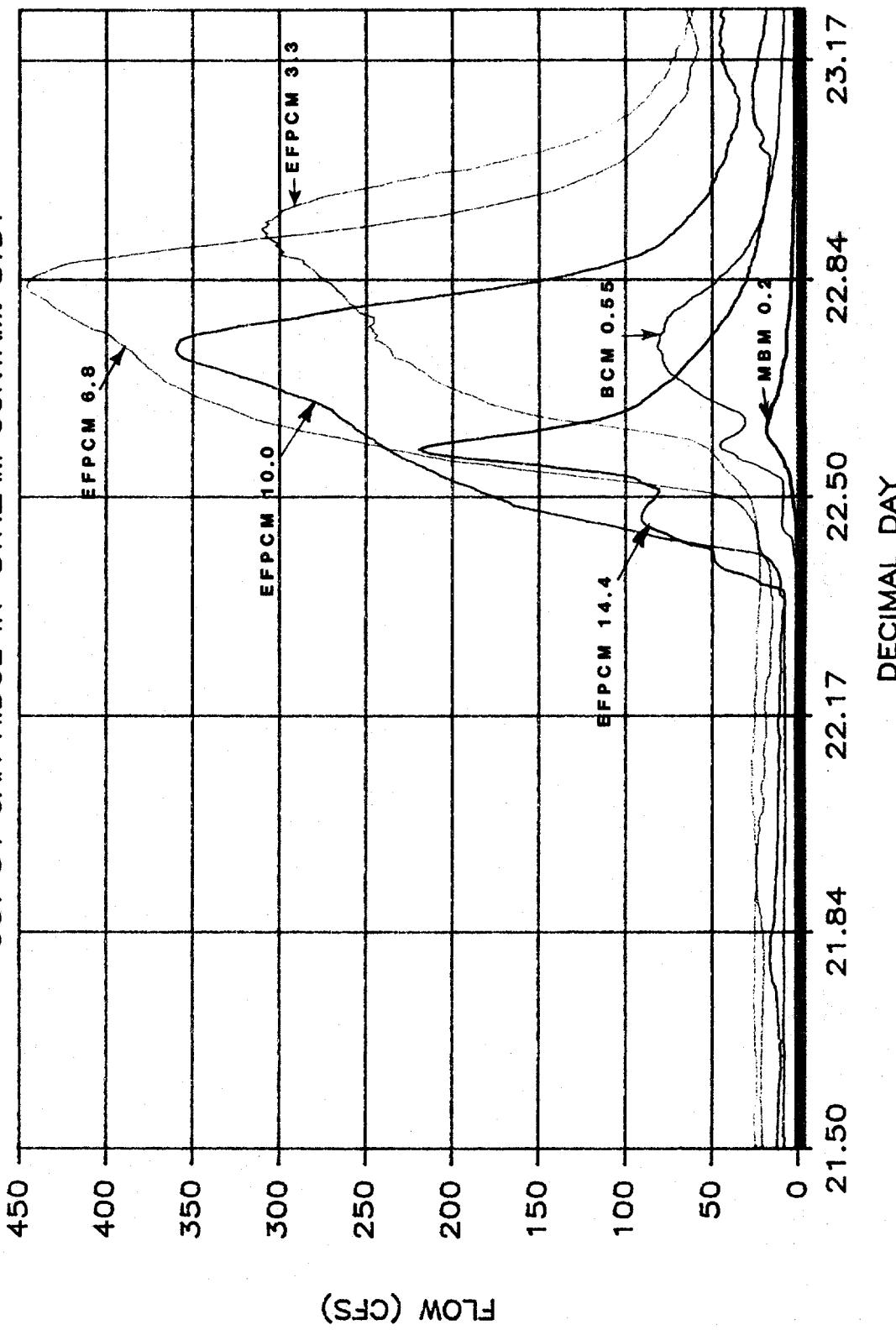
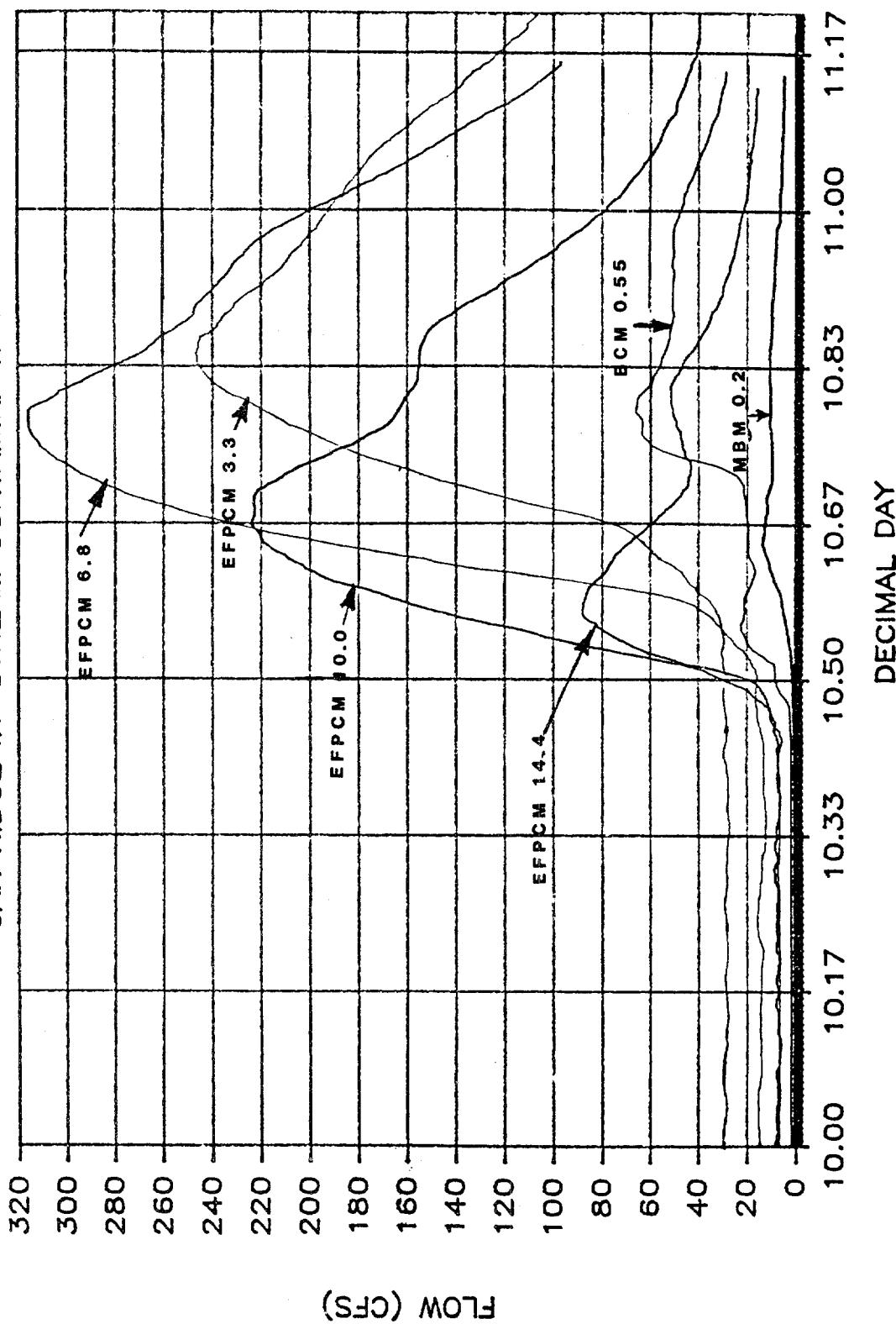


FIGURE 3(b)  
HYDROGRAPHS FOR RATED STATIONS—NOV 84  
OAK RIDGE IN-STREAM CONTAMINANT STUDY

34



are given in Tables 11 and 12, respectively. The specific gravity of suspended sediment ranged from 0.79 to 2.07 while the specific gravities of bedload sediment ranged from 1.34 to 2.46. Mehta (5) reports that the specific gravity of sediment are typically are in the range of 2.6 to 2.7 and that lesser values indicate the presence of organic material.

Particle size analyses results for suspended sediment (Table 11) show that the greatest concentrations were in the size ranges less than 62  $\mu\text{m}$ . For bedload sediment, particle size results are reported in terms of percent by weight rather than concentration. Table 12 provides the percent by weight of the total sample in various size ranges (gravel to silt). Although a wide distribution of sediment sizes was present, most of the bedload sediment generally was in the range of coarse sand to gravel (i.e., greater than 500  $\mu\text{m}$ ).

Further discussion of the physical characteristics of suspended and bedload sediment and an application of these data in a sediment transport model will be provided in the Task 3 report - (Sediment Transport).

#### 4.2.3 SUSPENDED SEDIMENT

Results of total and volatile suspended solids and turbidity analyses are presented in Table 1 of Appendices II and III for the first and second storm event, respectively. One hundred thirty-six samples were collected

TABLE 11  
INSTREAM CONTAMINANT STUDY - TASK 1  
STORMFLOW SAMPLING - PHYSICAL CHARACTERISTICS OF SUSPENDED SEDIMENT

Stream	Mile	Storm # <sup>1</sup>	Specific Gravity	Concentration of Suspended Sediment			
				2000 $\mu\text{m}$	500 $\mu\text{m}$	125 $\mu\text{m}$	Given Size <sup>2</sup>
East Fork Poplar Creek	14.36	1	1.55	<0.1	<0.1	1.1	5.3
		2	1.24	<0.1	<0.1	1.7	5.0
10.0	1	1.80	0.5	0.9	2.2	5.8	114
	2	1.36	<0.1	1.1	10.5	26.1	210
6.8	1	1.79	<0.1	<0.1	2.3	16.9	149
	2	1.59	<0.1	1.1	8.7	22.7	170
3.3	1	1.59	<0.1	0.9	10.7	39.8	348
	2	1.14	<0.1	<0.1	8.3	41.0	150
0.03	1	2.04	<0.1	0.5	3.5	26.2	260
	2	2.07	<0.1	1.1	10.8	31.1	190
Bear Creek	0.55	1	1.36	<0.1	0.4	2.7	9.7
	2	1.04	<0.1	0.2	2.2	7.4	50
Mill Branch	0.2	1	1.54	<0.1	<0.1	0.4	1.54
	2	0.79	<0.1	<0.1	<0.1	0.2	1.60
						8	18

<sup>1</sup>Storm #1 was conducted on October 22-23, 1984. Storm #2 was conducted on November 10-11, 1984.

<sup>2</sup>Concentrations of suspended sediment greater than 1 m are equivalent to the values for total nonfilterable suspended solids.

TABLE 1.2  
INSTREAM CONTAMINANT STUDY - TASK 1  
STORMFLOW SAMPLING - PHYSICAL CHARACTERISTICS OF BEDLOAD SEDIMENT<sup>1</sup>

Stream	Storm #	Mile	Traverse #	Specific Gravity	GRAVEL		FINE GRAVEL		COARSE SAND		MEDIUM TO FINE SAND		VERY FINE SAND		SILT	
					%>0.25 in	% by wt>2000 μm	%>0.25 in	% by wt>2000 μm	%>0.25 in	% by wt>2000 μm	%>0.25 in	% by wt>2000 μm	%>0.25 in	% by wt>2000 μm	%>0.25 in	% by wt>2000 μm
East Fork Poplar Creek	10.0	1	A	2.24	0	24.8	25.6	13.6	4.1	31.9	33.9	2.4	2.4	33.9	33.9	33.9
			B	2.18	0	7.2	30.0	26.5								
2	A	B	2.27	20	63.5	13.3	1.8	0.9	0.5	0.5	21.2	5.8	2.4	2.4	21.2	21.2
			1.36	10.4	10.3	28.5	23.8									
3.3	1	A	2.46	21.0	19.3	47.9	7.2	0.5	0.5	0.5	4.1	0.9	2.4	2.4	4.1	4.1
			B	2.34	63.2	16.2	13.0	2.5								
2	A	B	2.45	16.5	57.8	8.2	8.1	1.8	7.6	7.6	13.8	2.6	2.6	2.6	13.8	13.8
			1.34	0	14.6	42.9	26.1									

<sup>1</sup>Particle size designations obtained from ASCE Manual of Practice No. 54 SEDIMENTATION ENGINEERING, 1975 (6).

<sup>2</sup>Storm #1 was conducted on October 22-23, 1984. Storm #2 was conducted on November 10-11, 1984.

<sup>3</sup>Two samples were collected per station. The first sample was collected as a composite of several points in a traverse from the left bank (looking downstream) to the right bank. The second sample was collected in a traverse from the right bank to the left bank.

for total suspended solids analyses, 54 were collected for volatile suspended solids analyses, and 60 were collected for turbidity analyses.

Figure 2 of Appendices II and III shows total suspended solids and streamflow versus time for the duration of stormflow sampling for the first and second storm events, respectively. The graphs show that total suspended solids concentrations are generally proportional to streamflow. Turbidity values generally increase with increased total suspended solids and streamflow (Appendices II and III). A detailed assessment of the correlation between streamflow and suspended solids concentrations will be presented in the Task 3 report.

#### 4.2.4 MERCURY

The results of total and dissolved mercury analyses for 53 samples collected during the first and second storm events are presented in Table 1 of Appendices II and III, respectively. Figure 3 of Appendices II and III shows total mercury and streamflow versus time for the first and second storm events, respectively. The graphs also show the instances where total mercury concentrations were above the EPA Primary Drinking Water Standard of 2  $\mu\text{g}/\text{L}$  and the EPA Water Quality Criteria for the Protection of Aquatic Life (24-hour average) of 0.2  $\mu\text{g}/\text{L}$ . Total mercury concentrations for East Fork Poplar Creek were at or above both the drinking water standard and the water quality criteria for aquatic life for most samples collected during both storm events. Total mercury

concentrations for Bear Creek were below the drinking water standard but at or above the water quality criteria for aquatic life for both storm events. Maximum total mercury concentrations were 11 µg/L for both East Fork Poplar Creek Miles 14.36 and 3.3 during the first storm event and 24 µg/L for East Fork Poplar Creek Mile 14.36 during the second storm event.

Dissolved mercury concentrations (Appendices II and III) remained at or slightly above the analytical detection limit of 0.2 µg/L with a maximum concentration of 0.7 µg/L for both East Fork Poplar Creek Mile 10.0 and Bear Creek Mile 0.55 during the first storm event and 0.9 µg/L for East Fork Poplar Creek Mile 3.3 during the second storm event.

Figure 3 (Appendices II and III) shows that in many cases total mercury concentrations are proportional to streamflow and hence suspended sediment. In these cases it appears that mercury is being transported primarily by suspended sediment since dissolved mercury remains relatively constant with increasing streamflow. In other cases this relationship between total mercury and streamflow is not apparent (e.g., East Fork Poplar Creek Mile 3.3 and Bear Creek Mile 0.55 during the first storm event).

#### 4.2.5 RADIOLOGICAL ANALYSES

A total of nine samples were collected for radiological analyses during two storm events (Table 1 - Appendices II and III). A summary of the significant results are given in Table 13. The corresponding maximum permissible concentrations (MPCs), drinking water standards, and Tennessee River background levels are also given for comparison.

All results reported were substantially less than the MPC. Iodine 131 was identified in one sample at approximately two times the lower limit of detection and 5 percent of the corresponding MPC. The only other gamma emitting radionuclides found were lead, bismuth, and protactinium isotopes of the uranium decay series for which no MPCs are available.

### 4.3 QUALITY CONTROL

#### 4.3.1 BLANKS

Field blanks for priority pollutant analysis were analyzed with samples collected during baseflow conditions. All results were less than the analytical method detection limits.

#### 4.3.2 CONTROL CHARTS

Intralaboratory control charts for all parameters analyzed (with the exception of organic priority pollutants) were maintained as described in Section 3.4.1. All duplicate and spiked samples were either within the

TABLE 13

INSTREAM CONTAMINANT STUDY - TASK 1  
 STORMFLOW SURVEYS - MAXIMUM CONCENTRATIONS OF SIGNIFICANT RADIOISOTOPES IN  
 WATER SAMPLES AND APPLICABLE STANDARDS AND BACKGROUND LEVELS

Isotope	LLD <sup>1</sup> (pCi/L)	Standards and Background Levels (pCi/L)			Concentrations of Significant Isotopes - Two Stormflow Surveys <sup>5</sup>		
		Drinking Water Standard <sup>2</sup>	MPC <sup>3</sup> River	Tenn. <sup>4</sup> River	Bear Creek	East Fork Poplar Creek	
							(pCi/L)
Gross Alpha	2.0	15	30	4.0	8	15	(50%)
Gross Beta	2.4	— <sup>6</sup>	3,000	9.6	36	55	(2%)
I-131	8.0	— <sup>6</sup>	300	— <sup>7</sup>	7	14	(5%)
Pa-234m	—	— <sup>6</sup>	—	— <sup>7</sup>	— <sup>7</sup>	268	

<sup>1</sup>Lower limit of detection as calculated by the method developed by Pasternack and Harley and described in HASL-300 and Nuclear Instruments Method 91, 533-40 (1971).

<sup>2</sup>Interim Primary Drinking Water Regulations as outlined in 40 CFR 141.

<sup>3</sup>Maximum Permissible Concentrations (MPC) recommended by 10 CFR 20 for nonoccupational exposure.

<sup>4</sup>Maximum concentrations reported by TVA in the Tennessee River samples collected from 1981-83.

<sup>5</sup>The percentage of the MPC value is reported in parenthesis.

<sup>6</sup>No standard available.

<sup>7</sup>Isotope not identified in gamma spectral analyses.

"control limits" or when "out-of-control" situations occurred, all the samples within that batch were reanalyzed.

#### 4.3.3 REFERENCE SAMPLES

Reference samples were inserted into the analytical stream as described in Section 3.4.2. These samples were analyzed with the baseflow samples to assess the accuracy of the analytical measurements. The results of these analyses are tabulated in Appendix IV - Table 1.

Excellent recoveries were obtained for all metal and volatile organic analyses. The results for the base neutral and acid extractable compounds, however, showed a wide range of recoveries. A high of 169 percent recovery was obtained for 2-chloronaphthalene as compared to a low of zero percent recovery for 4,6-Dinitro-o-cresol, pentachlorophenol and phenol. These results are typical of the recovery data obtained by other laboratories for the analysis of the organic priority pollutant compounds using EPA method 625. Because of the inefficiency of this method to extract, concentrate, and analyze for many of the organic compounds, the method has been labeled by many as only semi-quantitative. Thus, results reported as less than the detection limit may not necessarily ensure the absence of the material in the environment.

#### 4.3.4 BLIND DUPLICATES (LABORATORY AND FIELD)

Blind field and laboratory duplicates were prepared and inserted into the analytical stream as described in Section 3.4.3. Results of these

duplicate samples are summarized in Appendix IV - Table 2 for nonradiological analyses and in Table 3 for radiological analyses.

The relative standard deviation (RSD) for nonradiological duplicate results were all less than 20 percent with the exception of lead, nickel, zinc, and total phenol. High RSD for these measurements were due to their low concentrations. Generally, the lower the analyte concentration in the sample, the less precise the analytical method and the less meaningful the RSD. Therefore, for samples having concentrations near the detection limit, RSD values of this magnitude can be expected.

The duplicate results for radiological analyses showed reasonable agreement between the two analyses with the error bands for each pair of analyses overlapping. A comparison of the laboratory and field duplicates for both the radiological and nonradiological parameters showed no homogeneity problems.

#### 4.3.5 EPA SPLIT SAMPLES

Split samples were prepared and shipped to the EPA Region IV Laboratory for nonradiological analyses and/or to the EPA Eastern Environmental Radiation Facility (EERF) for radiological analyses as directed in Section 3.4.4. Results of the split samples are summarized in Appendix IV - Tables 4 and 5.

The results of the split water samples with EPA were excellent especially when consideration is given to the low concentration obtained for most parameters. Gross alpha and gross beta analyses did not always correspond within error limits; however, this was not unexpected due to the nonspecific nature of these analyses. The results of split sample analyses indicated there was no significant analytical problems.

#### 4.3.6 CONCLUSIONS

The overall accuracy and precision of the data were adequate and within the interpretative requirements of this study. The agreement between EPA and TVA on the split data was acceptable. The quality control program did, however, reveal certain limitations which must be considered when interpreting the results on the extractable organic priority pollutant data. Because of the inefficiency of the EPA approved methods to extract many of the base neutral and acid extractable compounds, the reviewer of the data should realize that some of the organic compounds which were not detected by this method could be present in the environment.

## REFERENCES

1. Technical Workplan - Instream Contaminant Study prepared for Department of Energy, Oak Ridge Operations by the Tennessee Valley Authority, Office of Natural Resources and Economic Development, February 10, 1984.
2. Field Operations Natural Resource Engineering Procedures Manual, Volume 1, Tennessee Valley Authority, Division of Services and Field Operations, March 2, 1983.
3. Laboratory Branch Quality Manual, Tennessee Valley Authority, Division of Services and Field Operations.
4. Quality Assurance Program for the Oak Ridge Instream Contaminant Study, Tennessee Valley Authority, Division of Services and Field Operations, Laboratory Branch, April 1985.
5. Mehta, A. J., "Characterization Tests for Cohesive Sediments," Proceedings of the Conference on Frontiers in Hydraulic Engineering, Cambridge, Massachusetts, August 9-12, 1983, pp. 79-84.
6. Sedimentation Engineering, Manuals and Reports on Engineering Practice No. 54, American Society of Civil Engineers, 1975.

## **APPENDICES**

## CONTENTS

	<u>Page</u>
APPENDIX I - BASEFLOW SURVEY RESULTS.....	1
Table 1 - Field and Laboratory Analyses Results.....	2
APPENDIX II - STORMFLOW SURVEY RESULTS - FIRST STORM.....	31
Figure 1 - Streamflow Results - First Storm.....	32
Figure 2 - Total Suspended Solids and Streamflow Versus Time for Duration of First Storm Event (October 22-23, 1984).....	40
Figure 3 - Mercury and Streamflow Versus Time for Duration of First Storm Event (October 22-23, 1984).....	48
Table 1 - Water and Bedload Analyses Results - First Storm....	53
APPENDIX III - STORMFLOW SURVEY RESULTS - SECOND STORM.....	63
Figure 1 - Streamflow Results - Second Storm.....	64
Figure 2 - Total Suspended Solids and Streamflow Versus Time for Duration of Second Storm Event (November 10-11, 1984).....	72
Figure 3 - Mercury and Streamflow Versus Time for Duration of Second Storm Event (November 10-11, 1984).....	80
Table 1 - Water and Bedload Analyses Results - Second Storm...	85
APPENDIX IV - QUALITY CONTROL.....	97
Figure 1 - Sample Collection, Shipping, and Receiving.....	98
Figure 2 - Laboratory Analyses and Data Reporting.....	99
Laboratory Analyses Procedures.....	100
Table 1 - Summary of Unknown Reference Samples Submitted with Baseflow Water Samples.....	107
Table 2 - Results of Blind Laboratory and Field Duplicate Samples on Baseflow Water Samples - Nonradiological Analyses.....	109

	<u>Page</u>
Table 3 - Results of Blind Field Duplicate Samples on Baseflow Water - Radiological Analyses.....	110
Table 4 - Results of Split Sample Data with EPA, Region IV for Samples Collected on Baseflow Water - Nonradiological Analyses.....	111
Table 5 - Results of Split Sample Data with EPA Eastern Environmental Radiation Facility for Samples Collected on Baseflow Water - Radiological Analyses.....	112

**APPENDIX I**  
**INSTREAM CONTAMINANT STUDY - TASK 1**  
**BASEFLOW SURVEY RESULTS**

TABLE 1  
INSTREAM CONTAMINANT STUDY - TASK 1  
BASEFLOW SURVEY - FIELD AND LABORATORY ANALYSES RESULTS

STORED RETRIEVAL DATE 85/04/11

476507

35 59 49.3 084 14 27.3 1  
BELOW NEW HOPE POND DIVERSION POINT  
47001 TENNESSEE ANDERSON  
CLINCH RIVER BASIN 040102  
EAST FORK POPLAR CREEK 14.36  
132TVAC A40501

TYPE/AMENT/STREAM

DATE	TIME	DEPTH	LAB	SERIES	HSAMPLOC	CNDCTVY	TURRIDY	00010	00094	82079	00300	00400	00431	00530	
FROM	OF		IDENT.	CODE	1 FRCM	FIELD	LAB				DO	PH	TALK	RESIDUE	
TC	CAY	FEET		NUMBER	RT BANK	MICROMHO	NTU	M/G/L				FIELD	MG/L	TOT NFLT	MG/L
84/05/09	14	57	0001	0K1	90	18.5	520		8.5			6.20			
84/05/31	15	46	0001	OK4	50	22.4	454		8.3			8.05			
84/06/18	13	00		426	D1			3.5							
					50										
84/09/13	13	01		429	D1D										
				4609	OK4										

00005 FEET DEPTH CSN-RSP 0135368-0695J21

STORE1 RETRIEVAL DATE 95/04/11

476507  
 35 59 49.3 084 14 27.3 1  
 AFLW NEW HOPE POND DIVERSION POINT  
 47001 TENNESSEE ANDERSON  
 CLINCH RIVER BASIN 040102  
 EAST FORK POPLAR CREEK 14.36  
 132TVAC 840601

/TYPE/APPNT/STREAM

DATE	TIME	DEPTH	RESIDUE	OIL-GRSE	NH3+N+4-	TCT KJEL	00630	00665	00720	00900	01000
FRCM	OF	VOL	NFLT	FREON-GR	N TOTAL	N	N-TOTAL	PHOS-TNT	CYANIDE	TOT HARD	ARSENIC
TO	DAY	FEET	MG/L	MG/L	MG/L	MG/L	MG/L		CN-TNT	CACO3	AS,DISS
84/05/31	15	46	0.001	2	5.00U	0.11	0.68		MG/L	MG/L	UG/L
84/05/31	15	46	0.001								

1

DATE	TIME	DEPTH	BERYLIUM	CADMIUM	01025	01027	01030	01034	01040	01042
FRCM	OF	BE,DISS	BERYL	CD,DISS	CD,TOT	CD,TOT	CHROMIUM	COPPER	LEAD	
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	CR,DISS	CU,DISS	PB,DISS	
84/05/31	15	46	0.001							

2

-4-

DATE	TIME	DEPTH	THALLIUM	NICKEL	01065	01067	01075	01077	01090	01092
FRCM	OF	TL,DISS	TL,TOTAL	NI,DISS	NI,TOTAL	NI,TOTAL	SILVER	SILVER	ZINC	ZINC
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	AG,DISS	AG,TOT	ZN,TOT	ZN,TOT
84/05/31	15	46	0.001							

2

-4-

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01095
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SB,DISS
84/05/31	15	46	0.001						

1U

-4-

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01132	01145	01147	01147	01097
FRCM	OF	AL,TOT	LI,TOT	LI,TOT	LI,TOT	SE,DISS	SE,TOT	MERCURY	ANTIMONY
TO	DAY	FEET	UG/L	UG/L	UG/L	UG/L	UG/L	HG,DISS	SH,TOT
84/05/31	15	46	0.001						

STORED RETRIEVAL DATE 85/04/11

476507  
35 59 49.3 084 14 27.3 1  
RELW NEW HOPE POND DIVERSION POINT  
47001 TENNESSEE ANDERSON  
CLINCH RIVER BASIN 040102  
EAST FORK POPLAR CREEK 14.36  
132TVAC R40601

/TYPE/AMENT/STREAM

DATE FR CM TO	TIME OF DAY	DEPTH FEET	LAB IDENT. NUMBER	SERIES CCDE	ALPHA	01501 ALPHA-T TOTAL PC/L	03502 BETA-T TOTAL PC/L	07000 H-3 TOTAL PC/L	07001 H-3 TOTAL PC/L	13501 SR-90 TOTAL PC/L	13502 SR-90 TOTAL PC/L	
84/05/09 84/05/31 84/06/18	14 15 13 00	57 0001 0001	0001 6 426 429 4609	OK1 OK4 01 DID OK4	7.6	3.0	17.0	3.0	400	110		
84/09/13	11	05	0001									

STUREI RETRIEVAL DATE: 05/04/12

4765C7  
25 55 49.03 064 14 27.0 1  
EELOW NEW HOPE POND DIVERSION POINT  
47001 TENNESSEE RIVER BASIN  
CLINCH RIVER BASIN C4010,  
EAST FORK POPLAR CREEK 14.36

132TVCAC 840601 DEPTH 0 DATA LOCKED AFTER 8405

#	TYPE/AMENT/STREAM	DEPTH	DATA LOCKED AFTER 8405
1	INDEX 1C2150C	001720	793C 0510 0C80
2	FILES G952-RC 0046.50	567.70	012.00 005.47 014.36
3	INITIAL DATE		84/05/31 84/05/13
4	INITIAL TIME-DEPTH-RCVTGN		1546 0001 1105 0001
5	32101 CLICLERTM		TCTUG/L 10 L
6	32102 CARENET		TOTUG/L 10 L
7	32104 HRCMOFRM	WHL-WTR	UG/L 10 L
8	32105 CLICLBRT		TCTUG/L 10 L
9	32106 CHLIFORM		TCTUG/L 10 L
10	3273C PHEONLS	TOTAL	UG/L 10 L
11	34010 TOLLENE		TOT UG/L 10 L
12	34030 BENZENE		TOT UG/L 10 L
13	34200 ACENAPHT	HYLENE	TOTWUG/L 10 L
14	34205 ACENAPHT	HENE	TOTWUG/L 10 L
15	34210 ACROLEIN		TOTWUG/L 100 L
16	34215 ACRYLONI	TRILE	TOTWUG/L 100 L
17	34220 ANTHRACE	NE	TOTWUG/L 10 L
18	34230 EENZBFFLU	GRANT TO	TAL UG/L 10 L
19	34242 HENZOKK	FLUORANT	TCTWUG/L 10 L
20	34247 BENZOCAP	PYRENE	TOTWUG/L 10 L
21	34255 CELIABHC		TCTUG/L 0.01 L
22	34268 BISCHLCL	CETHYLE	TOTWUG/L 10 L
23	34273 BIS2CHL0	RCETHYLE	TOTWUG/L 10 L
24	34278 BIS2CHL0	RCETHXY	TOTWUG/L 10 L
25	34283 BIS2CHL0	RCISOFRO	TOTWUG/L 10 L
26	34292 NBB PHTH	TOTAL	UG/L 10 L
27	34301 CHLOROEE	NZENE	TOTWUG/L 10 L
28	34311 CHLOROET	HANE	TOTWUG/L 10 L
29	34320 CHRYSENE		TOTWUG/L 10 L
30	34336 CIEETHYL	HTHALATE	TOTWUG/L 10 L
31	34341 CIEETHYL	PTHALAT	TOTWUG/L 10 L
32	34346 12CIPHEN	VLYDRAZ	TOTWUG/L 10 L
33	34351 EMCSULSF		TOTWUG/L 0.01 L
34	34356 B-ENDO	SULFAN	TOTWUG/L 0.01 L
35	34361 A-ENDO	SULFAN	TOTWUG/L 0.01 L
36	34366 ENCRINAL	DEHYDE	TCTWUG/L C.01 L
37	34371 ETYLBEN	ZENE	TOTWUG/L 10 L
38	34376 FILCRANT	HENE	TOTWUG/L 10 L
39	34381 FLUCRENE		TOTWUG/L 10 L
40	34386 HEXACHL0	ROCYCLOP	TOTWUG/L 10 L
41	34391 HEXACHL0	RCUTADL	TOTWUG/L 10 L
42	34396 HEXACHL0	RCETHANE	TOTWUG/L 10 L
43	34403 INCENO CI	23CD)PYR	TOTWUG/L 10 L
44	34408 ISOPHONE		TCTUG/L 10 L
45	34413 METTYLPR	OMINE	TOTWUG/L 10 L
46		LORIDE	TCTUG/L 10 L
47		ECHLORID	TOTWUG/L 10 L
48		IPTROPIA	TOTWUG/L 10 L
49		IPHENYLA	TOTWUG/L 10 L
50		IPHENYLC	TOTWUG/L 10 L

(SAMPLE CONTINUED ON NEXT PAGE)

STORED RETRIEVAL DATE 4/5/04/12

4765C7 25 59 49.3 0E4 14 27.3 1

FELOW NEL HOPE ROAD CIVERSICH POINT

47001 TENNESSEE ANDERSON

CLINCH RIVER BASIN 040102

EAST FORK POPLAR CREEK 14-36

132 TVAC RA406C1 DEPTH 0 DATA LOCKED AFTER RA405

/TYPE/AMOUNT/STREAM

INDEX 1021500 007720 00920 791C 0510 0CAC

MILES 095.80 0046.50 561.70 012.00 005.47 C14.26

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE 84/05/31 84/09/13

INITIAL TIME-DEPTH-BOTTOM

1546 0001 1105 0003

24438 NITROSO<sub>2</sub> IMETHYLA TOTWUG/L 10 L

24447 NITRCHEN ZENE TOTWUG/L 10 L

24452 PARACHL0 RCHEM ACR TOTWUG/L 10 L

24461 PHENAN1H RENE TOTWUG/L 10 L

24469 PYRENE TOTWUG/L 10 L

24475 TEIACHL OROETHYL TOTWUG/L 10 L

24488 TRICHL0R OFLUOROM TOTWUG/L 10 L

24496 11C1CHL0 RCETHANE TOTWUG/L 10 L

24501 11C1CHL0 RCETHYLE TOTWUG/L 10 L

24506 112TRICH LCROETHA TOTWUG/L 10 L

24511 112TRICH LCROETHA TOTWUG/L 10 L

24516 1122TE TR ACHLOROE TOTWUG/L 10 L

24521 FENZOGH IMPERYLE TOTWUG/L 10 L

24526 BENZ0(A) ANTHRACE TOTWUG/L 10 L

24531 12C1CHL0 ROETHANE TOTWUG/L 10 L

24536 12C1CHL0 RCHEZEN TOTWUG/L 10 L

24541 12D1CHL0 RCPRCPAN TOTWUG/L 10 L

24546 12D1CHL0 RGETHYLE TOTWUG/L 10 L

24551 124TRICH LCROHENZ TOTWUG/L 10 L

24556 DIBENZ CA HANT+RA TOTWUG/L 10 L

24566 13D1CHL0 RCHEZEN TOTWUG/L 10 L

24571 14C1CHL0 RCHEZEN TOTWUG/L 10 L

24576 2CHLORCE THYL VINY TOTWUG/L 10 L

24581 2CHLORON APHTHALE TOTWUG/L 10 L

24586 2CHLORCP MENOL TOTWUG/L 10 L

24591 2NITROPH ENOL TOTWUG/L 10 L

24596 LINOCFTH TOTWUG/L 10 L

24601 24C1CHL0 ROPHENOL TOTWUG/L 10 L

24606 24CIMEIH YLPHENOL TOTWUG/L 10 L

24611 24CINIR OTOLUENE TOTWUG/L 10 L

24616 24CINIR OPHENOL TOTWUG/L 100 L

24621 24ETRICH LCROPHEN TOTWUG/L 10 L

24626 26CINIR OTOLUENE TOTWUG/L 10 L

24631 32C1CHL0 RCHEZID TOTWUG/L 25 L

24636 4BROMOPHEN TOTWUG/L 10 L

24641 4CHLORCP HENYLPHEN TOTWUG/L 10 L

24646 4NITROPH ENOL TOTWUG/L 10 L

24657 4ECINIIR OCRTHCRR TOTWUG/L 50 L

24668 6CHLORO C1FLUCRO TOTWUG/L 10 L

24671 FCB 1016 TGTWUG/L 0.1 L

24694 PHENOL TOTWUG/L 10 L

24696 NAPTHALE NE TOTWUG/L 10 L

29032 FCP TOTWUG/L 10 L

2910C H2E PH1H TOTAL UG/L 10 L

(SAMPLE CONTINUED ON NEXT PAGE)



STORED RETRIEVAL DATE 85/04/11

476514  
35 56 14.5 084 20 25.0 1  
AT NPDOS MONITORING STA. BEAR CR/WHITE WINGS RDS  
47145 TENNESSEE ROANE  
CLINCH RIVER BASIN 040102  
BEAR CREEK 2.  
13.2TVAC 940601

STYPA/APPEND/STREAM

00000 FEET DEPTH CSN-RSP 0135374-0695337

DATE	TIME	DEPTH	LAB	SERIES	HSAMPLOC	000010	CNDUCTVY	TURBDTY	00300	00400	00431	00530
FROM OF TC	TO DAY	FEET	IDENT.	CODE	% FRCM	WATER	FIELD	LAR	PH	TALK	FIELD	RESIDUE
			NUMBER	ALPHA	RT BANK	TEMP	MICROMHO	NTU			MG/L	TOT NFLT
84/05/09	15	35	0001	OK3	95	13.6				9.4		MG/L
84/06/20	17	00	474	017	90					6.60		

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01105	01132	SELENIUM	SE,DISS	01147	71900	MERCURY
FROM OF TC	TO DAY	FEET	AL,TOT	LI,TOT	UG/L	UG/L	SE,TOT	UG/L	01147	HG,DISS	HG,TOTAL
84/05/09	15	35	0001						0.2U		UG/L

DATE	TIME	DEPTH	ALUMINUM	LITHIUM	01105	01132	SELENIUM	SE,DISS	01147	71900	MERCURY
FROM OF TC	TO DAY	FEET	AL,TOT	LI,TOT	UG/L	UG/L	SE,TOT	UG/L	01147	HG,DISS	HG,TOTAL
84/05/09	15	35	0001						0.2U		UG/L

84/05/09 15 35 0001

00094

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

00300

00400

00431

00530

82079

STORED RETRIEVAL DATE 85/04/11

476513  
35 58 16.0 084 16 49.8 1  
UPSTREAM OF EASTERN MOST GATE TO LANDFILL AREAS  
47145 TENNESSEE  
CLINCH RIVER BASIN  
BEAR CREEK 7.4  
132TVAC 840720  
0000 FEET DEPTH

/TYPE/AMBN/T/STREAM

DATE FROM TC	TIME OF DAY	DEPTH IN FEET	LAB IDENT. NUMBER	00008 SERIES CCCE ALPHA	84068 HSAMPLE 2 FRM RT BANK	00002 CNDCTV FIELD CENT	00010 WATER TEMP NTU	00094 TURBIDY LAB	82079 DO	00300 PH	00400 SU	00431 TALK FIELD MG/L	00530 RESIDUE TOT NFLT MG/L
84/05/31 84/06/20	16 16	30 30	0001 473 476 476 476 477 4610	7 0K5 016 D160 500 0K5 0K5 0K5	5.0 5.0 5.0 5.0 5.0 5.0 5.0	17.0 D160 D160 500 500 500 500	2000L	1.6	9.3	7.86	176	2	
84/06/26	08	45	0001 0001 0001 0001	796 797 797 4610						7.70	174		
84/09/13	10	50	0001										

STORED RETRIEVAL DATE 85/04/11

476513

35 58 16.0 084 16 49.9 1

UPSTREAM OF EASTERN MOST GATE TO LANDFILL AREAS

47145 TENNESSEE ROANE

CLINCH RIVER BASIN 040102

BEAR CREEK 7.4

132TVAC R40720

0000 FEET DEPTH

CSN-RSP 0738620-0695335

/TYPE/A-BAT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	RESIDUE VOL NFLT	OIL-GRSE FREDON-GR	NH3+NH4- N TOTAL	TOT KJEL N MG/L	00625 00610	00630 N02&NO3 N-TOTAL	00665 PHOS-TOT	00720 CYANIDE	00900 TOT HARD	01000 ARSENIC
84/05/31 16 30	0001	2	5.00U	5.00U	0.17	0.38	240.00	380.00	0.01U	1000	1000	01002 AS-TOT
84/06/26 08	45	0001	08 46	0001			380.00					UG/L
84/09/13 10	50	0001										

0.02U

DATE FROM TO	TIME OF DAY	DEPTH FEET	BERYLIUM BE,DISS	CADMIUM CD,DISS	CHROMIUM CR,TOT	CHROMIUM CR,DISS	01030 01027	01034 01040	COPPER CU,DISS	COPPER CU,TOT	01042 LEAD
84/05/31 16 30	0001	10	10	10	10	10	26.0	26.0	UG/L	UG/L	PB,DISS

15

1

DATE FROM TO	TIME OF DAY	DEPTH FEET	THALLIUM TL,DISS	NICKEL NI,DISS	SILVER AG,DISS	SILVER AG,TOT	01075 01059	01077 01075	ZINC ZN,DISS	ZINC ZN,TOT	01092 ANTIMONY
84/05/31 16 30	0001	50	50	50	50	50	69	69	UG/L	UG/L	SB,DISS

37

1

DATE FROM TO	TIME OF DAY	DEPTH FEET	ALUMINUM AL,TOT	LITHIUM LI,TOT	SELENIUM SE,DISS	SELENIUM SE,TOT	01147 01145	71890 MERCURY			
84/05/31 16 39	0001	140	140	140	140	140	10	10	UG/L	UG/L	HG, TOTAL

80 0.2U 0.2

STORE 1 RETRIEVAL DATE 85/04/11

476513  
35 58 16•0 084 16 49•A 1  
UPSTREAM OF EASTERN MOST GATE TO LANDFILL AREAS  
47145 TENNESSEE  
CLINCH RIVER BASIN  
BEAR CREEK 7•4  
132 TVAC 840720

/TYPE/ABN/STREAM

DATE FROM	TIME OF DAY	DEPTH FEET	LAB IDENT.	SERIES CODE	ALPHA	00008	01501	01502	03501	07000	07001	13501	13502
TO								BETA-T	H-3	H-3•TOTL	SR-90	SR-90	PC/L
								ERROR	ERROR	ERROR	PC/L	PC/L	PC/L
								TOTAL	TOTAL	TOTAL	PC/L	PC/L	PC/L
								PC/L	PC/L	PC/L	PC/L	PC/L	PC/L
84/06/20	16	30	0001	7	OK5	31•0	31•0	16•0	330•0	40•0	500	110	
	16	31		473	D16								
				476	016D								
84/06/20	08	45	0001	796	OK5								
	08	46	0001	797	OK5								
84/09/13	10	50	0001	4610	OK5								

STORED RETRIEVAL DATE 85/04/12

476513  
35 58 16.0 0 84 16 49.8 1  
UPSTREAM OF EASTERN MCST GATE TO LANDFILL AREAS  
47145 TENNESSEE ROANE  
CLINCH RIVER BASIN C40102  
FEAR CREEK 74

132TWAC 840720 DEPTH 0 DATA LOCKED AFTER 8405

STYPA/AMENT/STREAM	INITIAL DATE	INITIAL TIME-DEPTH-BOTTOM	DATA
32101 CLICRMT		TCTUG/L	0.020
32102 CARBATE		TCTUG/L	0.010
32104 HFCMOFRM	WHL-WTR	U6/L	0.017
32105 CLICRMT		TCTUG/L	0.040
32106 CHLIFORM		TCTUG/L	0.013
32130 PENOLS	TOTAL	U6/L	84/05/31 84/09/13
32010 TOLLENE		TOT UG/L	1630 CC01 1050 00C1
24036 BENZENE		TOT UG/L	10 L
14200 ACENAPHT	HYDENE	TOTWUG/L	10 L
14205 ACENAPHT	HENE	TOTWUG/L	10 L
14210 ACROLEIN		TOTWUG/L	10 L
14215 ACRYLONI	TRYLE	TOTWUG/L	100 L
14220 ANTHRACE	NE	TOTWUG/L	10 L
14230 BENZBFLU	ORANT TO	TAL U6/L	10 L
14242 BENZO(K)	FLUORANT	TOTWUG/L	10 L
14247 BENZOC(A)	RCETHXY	TOTWUG/L	10 L
14255 CELIARHC	PYRENE	TOTWUG/L	10 L
14268 BISCHLOR	O METHYLE	TOTWUG/L	0.01 L
14273 BIS2CHLO	ROETHYLE	TOTWUG/L	10 L
34278 BIS2CHLO		TOTWUG/L	10 L
14281 BISZCHLO	RCISOPRO	TOTWUG/L	10 L
14292 NEE PATH	TOTAL	U6/L	10 L
14293 CHLCROB	NZENE	TOTWUG/L	10 L
24311 CHLCROET	HANE	TOTWUG/L	10 L
14320 CRYSENE		TOTWUG/L	10 L
24336 DIETHYL	H THALATE	TOTWUG/L	10 L
24341 CIMETHYL	PHTHALAT	TOTWUG/L	10 L
14346 12CIPHEN	V HYDRAZ	TCTWUG/L	10 L
24351 ENCSULSF		TCTUG/L	0.01 L
24356 E-ENDO	SULFAN	TOTWUG/L	0.01 L
24361 A-ENDO	SULFAN	TOTWUG/L	0.01 L
24366 ENDRINAL	DEHYDE	TOTWUG/L	0.01 L
24371 ETHYLHEN	ZENE	TOTWUG/L	10 L
24376 FILCRANT	HEAE	TCTWUG/L	10 L
24381 FLUCRENE		TOTWUG/L	10 L
24391 HEXACHLO	RCCYCLOC	TOTWUG/L	10 L
24396 HEXACHLC	RCHUTADI	TOTWUG/L	10 L
24403 INCEND(1	RCETHANE	TOTWUG/L	10 L
24408 ISPIRONE	23CD) PYR	TOTWUG/L	10 L
24413 MEIYLAR	OMIDE	TOTWUG/L	10 L
24418 METYLCH	L CRIDE	TOTWUG/L	10 L
24423 METHYLEN	ECHLORID	TOTWUG/L	10 L
24428 NITROUSO	I PROPYLA	TOTWUG/L	10 L
24433 NITROSCC	I PHENYL	TOTWUG/L	10 L

(SAMPLE CONTINUED ON NEXT PAGE)

STORED RETRIEVAL DATE 85/04/12  
 476513  
 \*5 58 1 6.0 0 84 16 43 8 1  
 UPSTREAM OF EASTERN MCST GATE TO LANDFILL AREAS  
 47145 TENNESSEE R CANE  
 CLINCH RIVER BASIN 040102  
 FEAR CREEK 7-4

132T VAC 890720 DEPTH 0 DATA LOCKED AFTER 8405  
 /TYPE/ATEN/STREAM

INDEX 102150C 00720 00920 7930 0510 0C9C 0020  
 FILES 0553-80 0046-50 567-70 012-00 005-47 001-47 07-40  
 (SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE	INITIAL TIME-DEPTH-BOTTOM	84/05/31 84/09/12
24438 NITROSCD	IMETHYL TOTWGL	10 L
24447 NITRCREN	ZENE TOTWGL	10 L
24452 PARACHLU	ROMETACR TOTWGL	10 L
24461 PHENANTH	RENE TOTWGL	10 L
24469 PYRENE	TOTWGL	10 L
24475 TETRACHL	GROETHYL TOTWGL	10 L
24486 TRICHLCR	OFLUOROM TOTWGL	10 L
24496 11DICHLO	RCETHANE TOTWGL	10 L
24501 11DICHLO	RCETHYLE TOTWGL	10 L
24506 111TRICH	LEROETHA TOTWGL	10 L
24511 112TRICH	LEROETHA TOTWGL	10 L
24516 1122TETR	ACHLOROE TOTWGL	10 L
24521 BENZO(GH	IOPERYLE TOTWGL	10 L
24526 BENZOC(A)	ANTHRACE TOTWGL	10 L
24531 12DICHLO	RCETHANE TOTWGL	10 L
24536 12DICHLO	RCHENZN TOTWGL	10 L
24541 12DICHLC	RCPRCAN TOTWGL	10 L
24546 12DICHLO	RCETHYLE TOTWGL	10 L
24551 124TRICH	LOROHNZ TOTWGL	10 L
24556 DIBENZ(CA	HANTRA TOTWGL	10 L
24566 12DICHLO	RCHENZN TOTWGL	10 L
24571 14DICHLO	RCHENZN TOTWGL	10 L
24576 2CHLOROE	THYL VINY TOTWGL	10 L
24581 2CHLORON	APHTHAL E TOTWGL	10 L
24586 2CHLOROP	HENOL TOTWGL	10 L
24591 2NITROPH	ENOL TOTWGL	10 L
24596 CINCTFH	TOTWGL	10 L
24601 24CICHLO	RCPHENOL TOTWGL	10 L
24606 241METH	YLPHENCL TOTWGL	10 L
24611 24CNITR	OTCLUENE TOTWGL	10 L
24616 24LINITR	OPHENCL TOTWGL	10 L
24621 246TRICH	LCROPHEN TOTWGL	10 L
24626 2ECINITR	OTJLUENE TOTWGL	10 L
24631 23CICHLO	RCHENZID TOTWGL	25 L
24636 4EFFCMOFH	ENYLPHEN TOTWGL	10 L
24641 4CHLORCP	HEXYLPHEN TOTWGL	10 L
24646 4NITROPH	ENOL TOTWGL	10 L
24657 4ECINITR	OCRTHCCR TOTWGL	50 L
24668 CICLORO	CIFLUCCRO TOTWGL	10 L
24671 FC3	1016 TOTWGL	C.1 L
24694 PHECL	TOTWGL	10 L
24696 NAPTHALE	NE T OTWGL	10 L
29032 PCF	TCT UGL	10 L
2910C H2E PHTH	TOTAL UGL	10 L
(*SAMPLE CONTINUED IN NEXT PAGE)		10 L

STORED RETRIEVAL DATE: 85/04/12

47653  
35 58 16.0 084 16 49.8 1  
UPSTREAM OF EASTERN MOST GATE TO LANDFILL AREAS  
47145 TENNESSEE RIVER BASIN  
CLINCH RIVER BASIN  
EAR CREEK 7.4

132 TVAC 840720 DEPTH 0 DATA LOCKED AFTER 8405

STYPA/AMOUNT/STREAM  
INDEX 1C2150G 007720 00920 79°C 061C 0CA0 0020

FILES 0951-80 0046-50 567.70 012.00 005.47 001.47 07.40

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE 84/05/31 84/07/13

INITIAL TIME-DEPTH-BOTTOM 1630 CC01 1C50 00C1

ITEM	CNB PHM	TOTAL	UG/L	10 L
29110	EFNZIDIN	TCTUG/L	50 L	
29120	VINYLCHL	ORLOC	TOT UG/L	10 L
29175	TRICHLCR	ETHYLENE	TOT UG/L	10 L
29180	P,F,ODI	TCT UG/L	C•01 L	
29300	P,P,ODD	TOT UG/L	0.01 L	
29310	P,P,ODD	TOT UG/L	0.01 L	
29320	P,P,ODE	TOT UG/L	0.01 L	
29330	ALCRIN	TOT UG/L	C•01 L	
29337	ALPHABHC	TCTUG/L	0.01 L	
29338	BETA BHC	TOTUG/L	C•01 L	
29340	GAMMAHBC	LINDANE	TOT•UG/L	0.01 L
29350	CHARDINE	TECH&PCP	TOT UG/L	C•01 L
29380	EIELDRIN	TOTUG/L	C•01 L	
29390	EMCRIN	TOT UG/L	C•01 L	
29400	ICAMPHEN	TOTUG/L	0.5 L	
29410	HEPTICHLR	TCTUG/L	C•01 L	
29420	HFCHLREP	TCTUG/L	0.01 L	
29488	PCB-1221	TOTUG/L	0.1 L	
29492	PCB-1232	TOTUG/L	0.1 L	
29496	PCB-1242	TCTUG/L	C•1 L	
29500	PCB-1248	TOTUG/L	0.1 L	
29504	PCB-1254	TOTUG/L	0.1 L	
29508	PCB-1260	TOTUG/L	0.1 L	
29700	HCB	TCT UG/L	10 L	
77161	1,2CCLPR	TOTAL	UG/L	10 L

STORE1 RETRIEVAL DATE 85/04/11

476516  
35 53 51-0 084 19 41-0 2

DOWNSTREAM OF WEIR

47145 TENNESSEE  
CLINCH RIVER BASIN  
WHITE OAK CREEK 0-4  
132TVAC 840601

ROANE  
040102

STY/PAMENT/ STREAM

DATE	TIME	DEPTH	LAB	SERIES	HSAMPLOC	00002	00010	00094	82079	00300	00400	00431	00530
FROM	OF	IDENT.	CODE	X	FRCM	FIELD	TEMP	CNDUCTVY	TURBIDY	09	PH	TALK	RESIDUE
TO	DAY	FEE T	RT BANK	ALPHA	RT BANK	CENT	MICROMHO	NTU	LAB	SU	FIELD	TOT NFLT	MG/L
84/05/31	11	03	0 001	8	OK6	99	990	17.6	395	21.0	6.2	7.40	109
	11	04	0 001	9	OK6D				22.0				18
84/09/13	13	20	0 001	4611	OK6							110	17
	13	21	0 001	4613	OK6D								

STORED RETRIEVAL DATE: 45/04/11

476515  
35 53 51.0 084 19 41.0 2  
DOWNSTREAM OF WEIR

47145 TENNESSEE  
CLINCH RIVER BASIN  
WHITEOAK CREEK 0.4  
132TVAC 840601  
040102

STYPS/APPNTS/STREAM

DATE FRM TO	TIME OF DAY	DEPTH VOL FEET	RESIDUE NFT	OIL-GRSE MG/L	NH3+NH4- N TOTAL MG/L	00510 TOT KJEL N	00625 PHOS-TOT MG/L	00530 NO2&NO3 N-TOTAL MG/L	00665 CYANIDE MG/L P	00720 CN-TOT MG/L	00900 TOT HARD CACO3 MG/L	01000 ARSENIC AS,DISS UG/L	01002 ARSENIC AS,TOT UG/L
84/05/31 11 03 0001 11 04 0001 13 21 0001	0001 0001 0001	3 3 3	5• 000 5• 000 5• 000	0•13 0•12 0•12	0•42 0•47 0•47	0•83 0•83 0•83	0•20 0•17 0•17			160 160 160	1U 1U 1U		
									0•02U 0•02U 0•02U				

0000 FEET DEPTH  
CSN-RSP 0735376-06935340

DATE FRM TO	TIME OF DAY	DEPTH VOL FEET	BERYLUM BE,TOT UG/L	CADMIUM CD,DIS S UG/L	01025 CD,TOT UG/L	01027 CADMIUM UG/L	01030 CR,DISS UG/L	01034 CHROMIUM CR,TOT UG/L	01040 COPPER CU,DISS UG/L	01042 COPPFER CU,TOT UG/L	01049 LEAD PB,TOT UG/L	01051 LEAD PB,TOT UG/L
84/05/31 11 03 0001 11 04 0001	0001 0001	10 10			0.1U 0.1U		9 9		5U 5U		3 3	

DATE FRM TO	TIME OF DAY	DEPTH VOL FEET	THALLIUM TL,DISS UG/L	NICKEL NI,DISS UG/L	01059 NI,TOTAL UG/L	01065 NICKEL NI,DISS UG/L	01067 NI,TOTAL UG/L	01075 SILVER AG,DISS UG/L	01077 SILVER AG,TOT UG/L	01090 ZINC ZN,DISS UG/L	01092 ZINC ZN,TOT UG/L	01095 ANTIMONY SB,DISS UG/L
84/05/31 11 03 0001 11 04 0001	0001 0001	500 500			500 500		4 5		0.2U 0.2U	24 30	1U 1U	

DATE FRM TO	TIME OF DAY	DEPTH VOL FEET	ALUMINUM AL,TOT UG/L	LITHIUM LI,TOT UG/L	01105 LI,TOT UG/L	01132 LITHIUM LI,TOT UG/L	01145 SE,DISS UG/L	01147 SE,TOT UG/L	71890 MERCURY HG,DISS UG/L	71900 MERCURY HG,TOTAL UG/L	
84/05/31 11 03 0001 11 04 0001	0001 0001	210 200			10U 10U		10 10		0•2U 0•2U	0•2U 0•3	

STORED RETRIEVAL DATE 85/04/11

476516  
35 53 51.0 084 19 41.0 2

DOWNSTREAM OF WEIR  
47145 TENNESSEE  
CLINCH RIVER BASIN  
WHITEOAK CREEK 0.4  
132TVAC 840601  
0000 FEET DEPTH

ROANE  
040102

STYPA/AMBIENT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00008 LAH IDENT. NUMBER	84068 SERIES CODE ALPHA	01501 ALPHA-1 TOTAL PC/L	01502 ALPHA-1 TOTAL PC/L	03501 BETA-T TOTAL PC/L	03502 BETA-T TOTAL PC/L	07000 H-3 TOTAL PC/L	07001 H-3 TOTAL PC/L	13501 SR-90 TOTAL PC/L	13502 SR-90 TOTAL PC/L	
84/05/31 11 03 84/09/13 13 20	00 01 00 01	8 9 4611 4613	0K6 0K6D 0K6 0K6D	0K6 0K6D 0K6 0K6D	10.2 10.8	3.5 3.6	690.0 690.0	690.0 690.0	70.0 70.0	540000 544000	53000 53000	2	2

DATE FROM TO	TIME OF DAY	DEPTH FEET	22606 U-234 TOTAL PC/L	22607 U-234 TOTAL PC/L	28401 CS-137 TOTAL PC/L	28402 CS-137 TOTAL PC/L	29601 CO-50 TOTAL PC/L	29602 CO-50 TOTAL PC/L	22150 NP-237 TOTAL PC/L	22505 TH-228 TOTAL PC/L	22622 U 235, T TOTAL PC/L
84/05/31 11 03 84/09/13 11 04	00 01 00 01	57 68	5 7	5 7	18 19	4 2	5 7	22150 NP-237 TOTAL PC/L	22505 TH-228 TOTAL PC/L	22622 U 235, T TOTAL PC/L	

## STORED RETRIEVAL DATE 05/04/12

476516 35 53 E1.0 0E4 13 41.C 2

TOWNSTREAM OF LEIR

ROANE

040102

4745 TENNESSEE

CLINCH RIVER HASIN

WHITECAK CREEK 0.4

1327VAC 840601 DEPTH 0 DATA LOCKED AFTER 9405

## /TYPE/AMENT/STREAM

INCEN 1C2150C 007/20 00920 793C 075C

FILES 0552.R0 0046.50 567.70 020.44 000.40

INITIAL DATE 04/05/31 84/05/31 84/05/31

INITIAL TIME-DEPTH-BCITCM 1102 0001 1104 0001 1320 0001 1321 0001

22101 DICLBRM TCTUG/L 10 L 10 U

22102 CARENET TCTUG/L 10 L 10 U

32104 BROMOFRM WHL-WIR UG/L 10 L 10 U

32105 CLICLIBRMT TCTUG/L 10 L 10 U

32106 C-LARFORM TCTUG/L 10 L 10 U

22730 PHENOLS TOTAL UG/L 10 L 10 U

24010 TOLUENE TOT UG/L 10 L 10 U

34030 BENZENE TOT UG/L 10 L 10 U

34200 ACENAPHT HYDENE TOTWUG/L 10 L 10 U

34205 ACENAPHT HENE TOTWUG/L 10 L 10 U

34210 ACRCLE IN TOTWUG/L 100 L 100 U

34215 ACRYLONI TRILE TOTWUG/L 100 L 100 U

34220 ANTRACE NE TOTWUG/L 10 L 10 U

34230 BENZBFLU ORANT TO TAL UG/L 10 L 10 U

34242 BENZOKM FLUORANT TOTWUG/L 10 L 10 U

34247 BENZOKA PYRENE TOTWUG/L 10 L 10 U

34259 CELTABYC TOTAL UG/L 0.01 L 0.01 U

34268 FISCHLOR OMETHYLE TOTWUG/L 10 L 10 U

34272 BIS2CHLO ROETHYLE TOTWUG/L 10 L 10 U

34278 BIS2CHLO ROETHCXV TOTWUG/L 10 L 10 U

34283 BIS2CHLO RCISOPRO TOTWUG/L 10 L 10 U

34292 NEE PHTH TOTAL UG/L 10 L 10 U

34301 CHLCROB ZENE TOTWUG/L 10 L 10 U

34311 CHLCROET HANE TOTWUG/L 10 L 10 U

34320 CHRYSENE TOTWUG/L 10 L 10 U

34336 DIE THYL HTHALATE TOTWUG/L 10 L 10 U

34341 DIPETHYL PTHALAT TOTWUG/L 10 L 10 U

34346 12CIPHEN YLHYDRAZ TOTWUG/L 10 L 10 U

34351 ENCSULSF SULFAN TOTWUG/L 0.01 L 0.01 U

34356 B-ENDO SULFAN TOTWUG/L 0.01 L 0.01 U

34361 A-ENDO DEHYDE TOTWUG/L 0.01 L 0.01 U

34366 ENCRINAL ZENE TOTWUG/L 0.01 L 0.01 U

34371 ETYLBN HENE TOTWUG/L 0.01 L 0.01 U

34376 FLUORANT HENE TOTWUG/L 0.01 L 0.01 U

34381 FILCRENE TOTWUG/L 0.01 L 0.01 U

34386 HEXACHLO RCCYCLOOP TOTWUG/L 10 L 10 U

34391 HEXACHLO RCBUTADI TOTWUG/L 10 L 10 U

34396 HEXACHLO ACETHANE TOTWUG/L 10 L 10 U

34403 INCENDOC1 23CD)FYR TOTWUG/L 10 L 10 U

34408 ISOPHRONE TCTUG/L 10 L 10 U

34413 METYLBR CMIDE TCTUG/L 10 L 10 U

34416 METYLCH LORIDE TOTWUG/L 10 L 10 U

34423 METHYLEN ECHLORID TOTWUG/L 10 L 10 U

34428 NITROSOD IFROPYLA TOTWUG/L 10 L 10 U

34432 NITROSCU IPHENYL TOTWUG/L 10 L 10 U

(SAMPLE CONTINUED ON NEXT PAGE)



STORED RETRIEVAL DATE 85/04/12

476516 35 53 51.0 084 13 41.0 2

DOWNSCREEN OF WEIR

47145 TENNESSEE ROANE  
CLINCH RIVER BASIN 040102

WHITECAK CREEK 0.4

1321VAC 840601 DEPTH 0 DATA LOCKED AFTER 8405

#TYPE/AGENT/STREAM INDEX 1021500 007720 00920 1930 0950

FILES C95J•80 0046•50 567•70 020•84 001•40

{SAMPLE CONTINUED FROM PREVIOUS PAGE}

INITIAL DATE 84/05/31 84/09/13 84/09/13

INITIAL TIME-DEPTH-BOTTOM

1102 00C1 1104 00C1 1320 0001 1321 0001

29110 CNB PMH TOTAL UG/L TCTUG/L

29120 EENZIDIN ORKOC TOT UG/L 50 L 50 U

29175 VINYLCHL ORKOC TOT UG/L 10 L 10 U

29180 TRICHLQR ETHYLENE TOT UG/L 10 L 10 U

29300 P•P•DDT TOT UG/L 0•01 L 0•01 U

29310 P•P•DDO TOT UG/L 0•01 L 0•01 U

29320 P•P•ODE TOT UG/L 0•01 L 0•01 U

29330 ALCRIN TOT UG/L 0•01 L 0•01 U

29337 ALPHABHC TOTUG/L 0•01 L 0•01 U

29338 BE1A BMC TOTUG/L 0•01 L 0•01 U

29340 GRANBHC LINDANE TOT UG/L 0•01 L 0•01 U

29350 CHLORDANE TECH&PET TOT UG/L 0•01 L 0•01 U

29380 CIELDRIN TOTUG/L 0•01 L 0•01 U

29390 ENCRIN TOT UG/L 0•01 L 0•01 U

29406 TOXAPHEN TOTUG/L C•5 U 0•5 U

2941C HEPICHLR TOTUG/L C•01 L 0•01 U

29420 HPCHLREP TOTUG/L 0•01 L 0•01 U

29488 PCB-1221 TOTUG/L 0•1 L 0•1 U

29492 PCB-1232 TCTUG/L C•1 U 0•1 U

29496 PCB-1242 TC1UG/L 0•1 L 0•1 U

29500 PCB-1248 TOTUG/L 0•1 L 0•1 U

29504 PCB-1254 TOTUG/L 0•1 L 0•1 U

29508 PCB-1260 TOTUG/L 0•1 U 0•1 U

29700 HCB TOT UG/L 10 L 10 U

77161 1,2DCLPR TOTAL UG/L 10 L 10 U

STORE 1 RETRIEVAL DATE 95/04/11

476558  
35 59 48.0 0R4 20 27.0 2  
BELOW INDIAN CREEK NEAR USGS STREAM GAGE  
47145 TENNESSEE ROANE  
CLINCH RIVER BASIN  
POPLAR CREEK 13.8  
132TVAC 84050R

/TYPE/ABNT/STREAM

DATE FROM FR CM TO TC	TIME OF DAY	DEPTH FEET	LAB IDENT. CODE	SERIES ALPHA	00008 HSAMPLOC X FR CM RT BANK	00002 WATER TEMP CENT	00010 CONDUCTV FIELD	00094 TURBIDTY LAR	00300 DO	00400 PH	00431 TALK FIELD	00530 RESIDUE TOT NFLT MG/L
84/05/31 17 46	0001	16	OK18		50	14.0	23.0			9.2	7.70	4.9

84/05/31 17 46 0001

DATE FROM FR CM TO TC	TIME OF DAY	DEPTH FEET	RESIDUE VOL NFLT MG/L	OIL-GRSE FREON-GR MG/L	NH3+N+4- N TOTAL MG/L	TOT KJEL MG/L	00610 N MG/L	00625 N MG/L	00630 NO2&NO3 N-TOTAL MG/L	PHOS-TOT MG/L	CYANIDE CN-TOT MG/L	00720 CACO3 MG/L	00900 TOT HARD MG/L	01000 ARSENIC AS,DISS UG/L
84/05/31 17 46	0001													

84/05/31 17 46 0001

DATE FROM FR CM TO TC	TIME OF DAY	DEPTH FEET	BERYLUM BE-DISS UG/L	01010 BERYLIUM RE*TOT UG/L	01012 CADMIUM CD,DISS UG/L	01025 CADMIUM CD,TOT UG/L	01030 CHROMIUM CR,DISS UG/L	01034 COPPER CU,TOT UG/L	01040 COPPER CU,DISS UG/L	01042 LEAD PB,DISS UG/L	01049 LEAD PB,TOT UG/L	01051 LEAD PB,TOT UG/L
84/05/31 17 46 0001		10		10	0.10	0.10	10	10	5U	5U	1	2

STORED RETRIEVAL DATE 45/04/11

4 76558 35 59 48.0 084 20 27.0 2  
BELOW INDIAN CREEK NEAR USGS STREAM GAGE  
47 145 TENNESSEE ROANE  
CLINCH RIVER BASIN 040102

/TYPEA/COMVENT/STREAN

DATE	TIME	DEPTH	THALLIUM	SILVER	ZINC	ANTIMONY
FFRCM	OF	TL,DISS	NICKEL	SILVER	ZINC	ANTIMONY
TO	DAY	FEET	NI,DISS	NI,TOTAL	ZN,DISS	SR,DISS
10/10/73	10:05	THALLIUM	NICKEL	SILVER	ZINC	ANTIMONY
		TL,TOTAL	NI,DISS	NI,TOTAL	ZN,DISS	SR,TOT
		UG/L	UG/L	UG/L	UG/L	UG/L

卷之三

84185 / 31 13 46 0001

1U 0.2U 0.2U

-23-



STORED RETRIEVAL DATE: 85/04/11

476557  
35 53 32.0 084 27 48.0 2

WATTS BAR RESERVOIR

47145 TENNESSEE  
TF NNFSEEE RIVER BASIN ROANE  
CLINCH RIVER 6.8  
132 TWAC R40608

/TYPE/AMENT/STREAM

00000 FEET DEPTH CSN-RSP 0735514-0695415

DATE	TIME	DEPTH	ALUMINUM	011132	011145	011147	711900
FROM FR CM	OF TO	DAY	AL. TOT	LITHIUM	SELENIUM	MERCURY	MERCURY
T C	DAY	FEET	UG/L	LI+TOT	SE+DISS	HG+TOTAL	HG+TOTAL
84/05/30	13	08	0016		UG/L	UG/L	UG/L
				10	10	0.2U	0.2U

DATE	TIME	DEPTH	LAB	00008	01501	01502	03501	03502	07000	07001	13501
FROM FR CM	OF TO	DAY	IDENT.	SERIES	ALPHA	ALPHA-T	BETA	BETA-T	H-3 TOTAL	H-3 TOTAL	SR-90
T C	DAY	FEET	NUMBER	CCDE	TOTAL	ERROR	TOTAL	ERROR	PC/L	PC/L	ERROR
84/05/30	13	08	0016		ALPHA	PC/L	PC/L	PC/L			PC/L
				15	OK17						

DATE	TIME	DEPTH	PB-212	17517	22012	22014	22100	22101	22501	22502	22601
FROM FR CM	OF TO	DAY	TOTAL	TOTAL	PU-238	PU-239	TC-99	TC-99	TH-232	TH-232	U-238
T C	DAY	FEET	PC1/L	PC1/L	TOTAL	TOTAL	TOTAL	ERROR	TOTAL	PC/L	PC/L
84/05/30	13	08	0016		PC1/L	PC1/L	PC1/L	PC1/L	PC1/L	PC1/L	PC/L
				0.027K	0.027K	0.73	1.50	0.094	0.038	0.097	0.0355

DATE	TIME	DEPTH	U-234	222606	222607	28401	28402	29601	29602	22150	22505
FROM FR CM	OF TO	DAY	TOTAL	ERROR	TOTAL	CS-137	CS-137	CO-60	NP-237	TH-228	U 235, T
T C	DAY	FEET	PC1/L	PC1/L	PC1/L	PC1/L	PC1/L	PC1/L	PC1/L	PC1/L	PC/L
84/05/30	13	08	0016		PC1/L	PC1/L	PC1/L	PC1/L	PC1/L	PC1/L	PC/L
				1.10	0.114						



STORED RETRIEVAL DATE 85/04/11

47651A  
35 54 01.0 084 23 15.0 2  
BETWEEN WHITEMAK CREEK AND POPLAR CREEK  
47145 TENNESSEE ROANE  
TENNESSEE RIVER BASIN  
CLINCH RIVER 15.0  
132TVAC 840401

/TYPE/APPEND/STREAM

DATE FROM	TIME OF DAY	DEPTH FEET	LAB IDENT.	SERIES CODE	00008	84068	01501	01502	03501	03502	07000	07001	13501	13502	
TO	DAY	FEET	NUMBER	ALPHA	PC/L	PC/L	ALPHA	BETA-T	BETA-T	ERROR	H-3 TOTAL	H-3 TOTAL	SR-90	SR-90	
84/05/31	12	00	0001	0K8	2.1	2.1	1.6	TOTAL	TOTAL	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L
								PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L

DATE FROM	TIME OF DAY	DEPTH FEET	LAB IDENT.	SERIES CODE	17517	17518	22012	22014	22100	22101	22501	22502	22601	22602
TO	DAY	FEET	NUMBER	ALPHA	PC/L	PC/L	PU-212	PU-239	TC-99	TC-99	TH-232	TH-232	U-238	U-238
84/05/31	12	00	0001	0K8	2.1	2.1	TOTAL	TOTAL	TOTAL	TOTAL	ERROR	ERROR	TOTAL	TOTAL
							PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L

84/05/31 12 00 0001

7



STORED RETRIEVAL DATE 85/04/11

 476556  
 35 52 43.0 084 17 21.0 2  
 MELTON HILL RESERVOIR

 47145 TENNESSEE  
 TENNESSEE RIVER BASIN

 CLINCH RIVER 24.0  
 132TVAC 840608

0000 FEET DEPTH

CSN-RSP 0735513-0695413

/TYPE/APPNT/STREAM

DATE FR CM TO TG	TIME OF DAY	DEPTH FEET	LAR IDENT. NUMBER	SERIES CCDE ALPHA	HSAMPLOC * FRCM RT BANK	00002 TEMP CENT	00010 WATER FIELD CENT	00094 CONDUCTY FIELD MICROHDO	82079 TURBIDY LAB NTU	00300 DO	00400 PH	00431 TALK FIELD SU	00530 RESIDUE TOT NFLT MG/L
84/05/30	11	22	0001			50	17.1	280		13.2	8.30		
	11	23	0003			50	16.7	280		13.0	8.30		
	11	24	0007			50	16.7	280		12.9	8.20		
	11	25	0010			50	16.5	280		12.7	8.20		
	11	26	0013			50	16.5	280		12.7	8.20		
	11	27	0016			50	15.8	280		12.6	8.20		
	11	28	0020			50	14.9	280		11.8	7.90		
	11	29	0023		14	OK16	14.5	280		11.7	7.90		
	11	32	0026			50	14.3	280		11.7	7.80		
	11	34	0030			50	14.3	280		11.8	7.80		
	11	36	0033			50	14.3	280		11.8	7.80		
	11	38	0043			50	13.8	280		11.6	7.80		
84/07/26	13	00	2303	F1		4.0							

DATE FR CM TO TG	TIME OF DAY	DEPTH FEET	RESIDUE VOL.NFLT	OIL-GRSE FREON-GR	NH3+NH4- N TOTAL	00610 N-TOTAL MG/L	00625 TOT KJEL MG/L	NO2&NO3 N-TOTAL MG/L	00665 PHOS-TOT MG/L P	00720 CYANIDE CN-TOT MG/L	00900 TOT HARD CACO3 MG/L	01000 ARSENIC AS-DISS UG/L
84/05/30	11	30	0023									01002

STORE 1 RETRIEVAL DATE 85/04/11

476556  
35 52 4 3•0 084 17 21•0 2

MFLTON HILL RESERVOIR

47145 TENNESSEE

TENNESSEE RIVER BASIN

CLINCH RIVER 24•0

132TVAC 840608

0000 FEET DEPTH

CSN-RSP 0735513-0695413

/TYPE/AMENT/STREAM		DATE	TIME	DEPTH	BERYLUM	01012	01025	CADMIUM	01027	CHROMIUM	01030	CHROMIUM	01034	COPPER	01040	COPPER	01042	COPPER	01049	LEAD	01051
FROM	TO	OF	DAY	FEET	BE•DISS	UG/L	BE•TOT	CD•DISS	CD•TOT	CR•DISS	CR•TOT	CU•DISS	CU•TOT	UG/L	UG/L	UG/L	UG/L	PB•DISS	PB•TOT	UG/L	UG/L
84/05/30	11	30	0023			1U	1U	0•1U	0•1U	0•1U	0•1U	0•1U	0•1U	1U	1U	5U	5U	1U	1U	1U	1U

/TYPE/AMENT/STREAM		DATE	TIME	DEPTH	THALLIUM	01057	01059	NICKEL	01065	NICKEL	01075	SILVER	01077	SILVER	01090	ZINC	01092	ZINC	01095	ANTIMONY	01097	
FROM	TO	OF	DAY	FEET	TL•DISS	TL•TOTAL	NI•DISS	NI•TOTAL	NI•TOT	AG•DISS	AG•TOT	UG/L	UG/L	UG/L	UG/L	ZN•DISS	ZN•TOT	UG/L	UG/L	SR•DISS	SR•TOT	UG/L
84/05/30	11	30	0023			50U	50U	2	2	2	2	0•2U	0•2U	5U	5U	6	6	1U	1U	1U	1U	

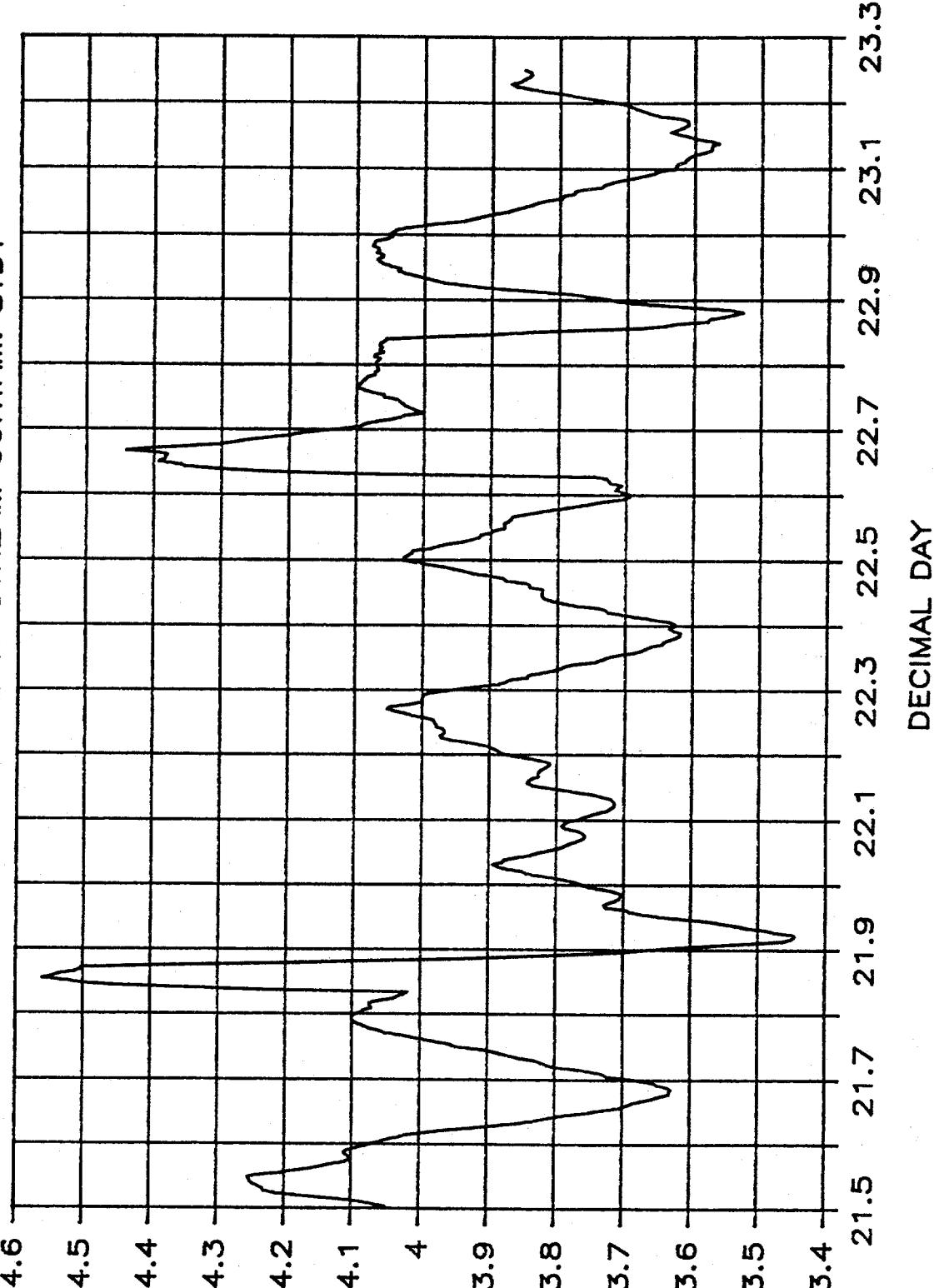
/TYPE/AMENT/STREAM		DATE	TIME	DEPTH	ALUMINUM	01105	01132	LITHIUM	01145	SELENIUM	01147	MERCURY	71890	MERCURY	HG•DISS	HG•TOT	HG•TOTAL	HG•TOTAL		
FROM	TO	OF	DAY	FEET	AL•TOT	LI•TOT	LI•TOT	UG/L	UG/L	SE•DISS	SE•TOT	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L			
84/05/30	11	30	0023						1U	1U	1U	1U	0•2U	0•2U	0•3	0•3	0•3	0•3	0•3	0•3

**APPENDIX II**  
**INSTREAM CONTAMINANT STUDY - TASK 1**  
**STORMFLOW SURVEY RESULTS - FIRST STORM**

**FIGURE 1**  
**STREAMFLOW RESULTS - FIRST STORM**

EAST FORK POPLAR CREEK - MI 0.03

OCT 84-OAK RIDGE IN-STREAM CONTAM. STDY

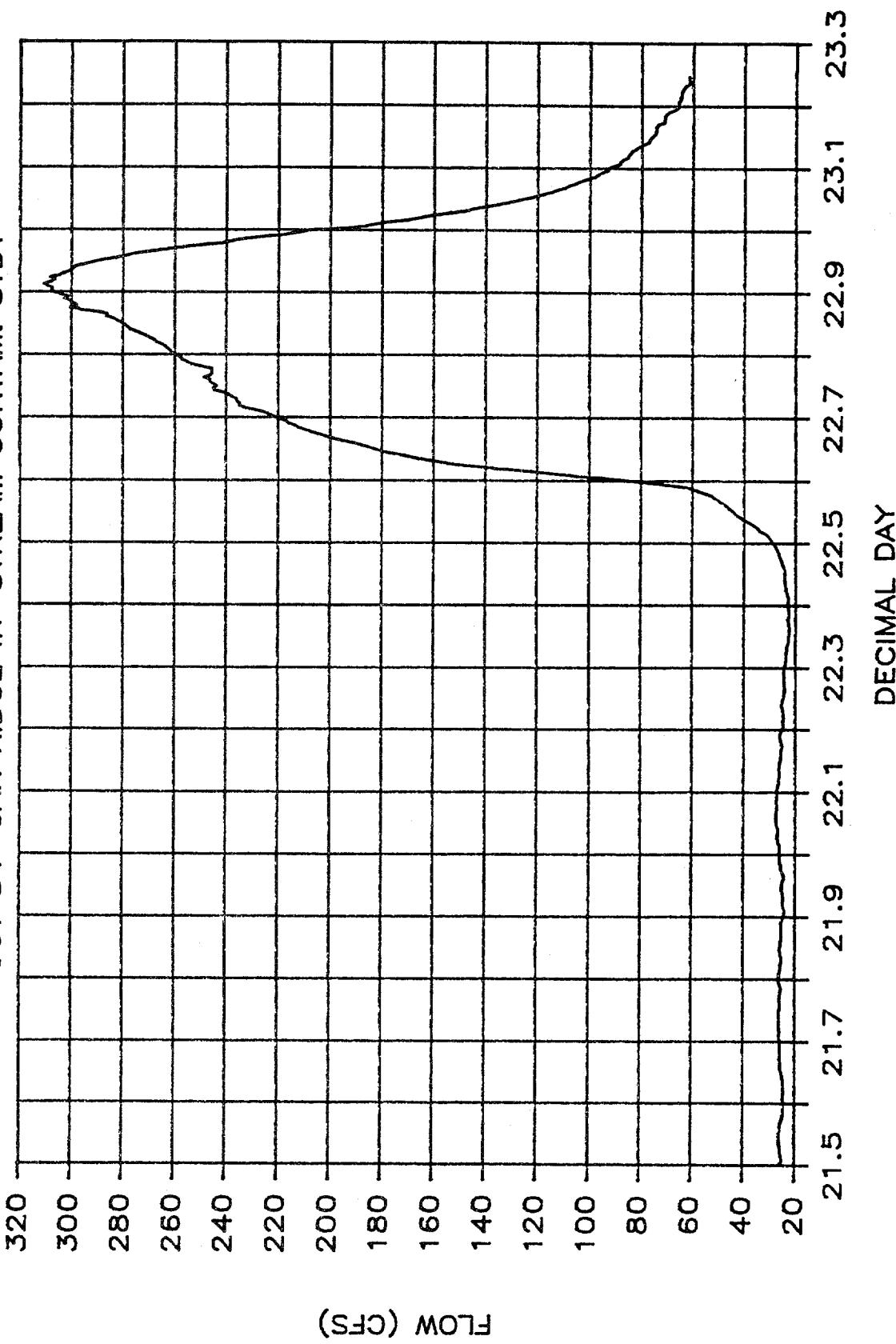


GAGE HEIGHT (FT)

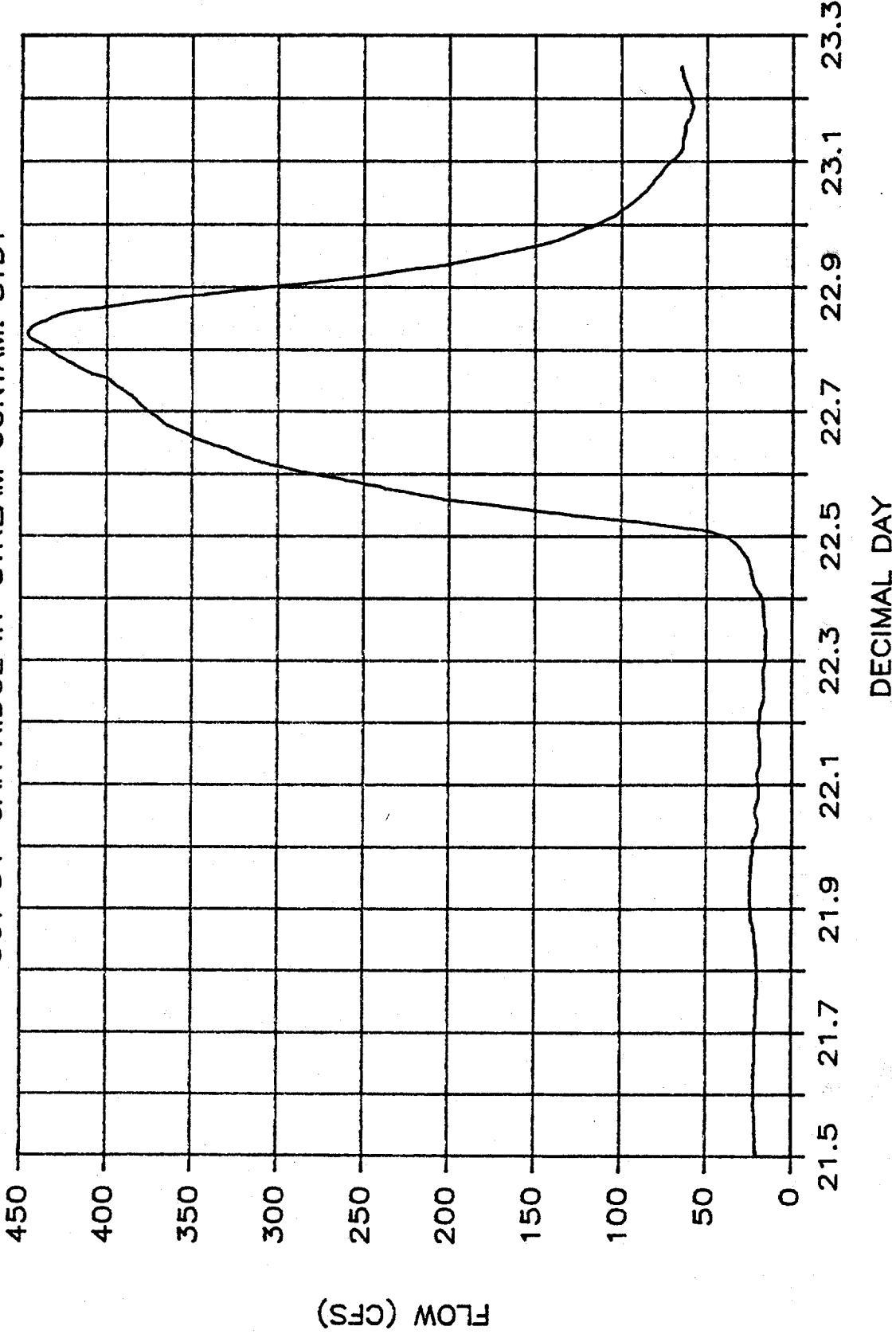
DECIMAL DAY

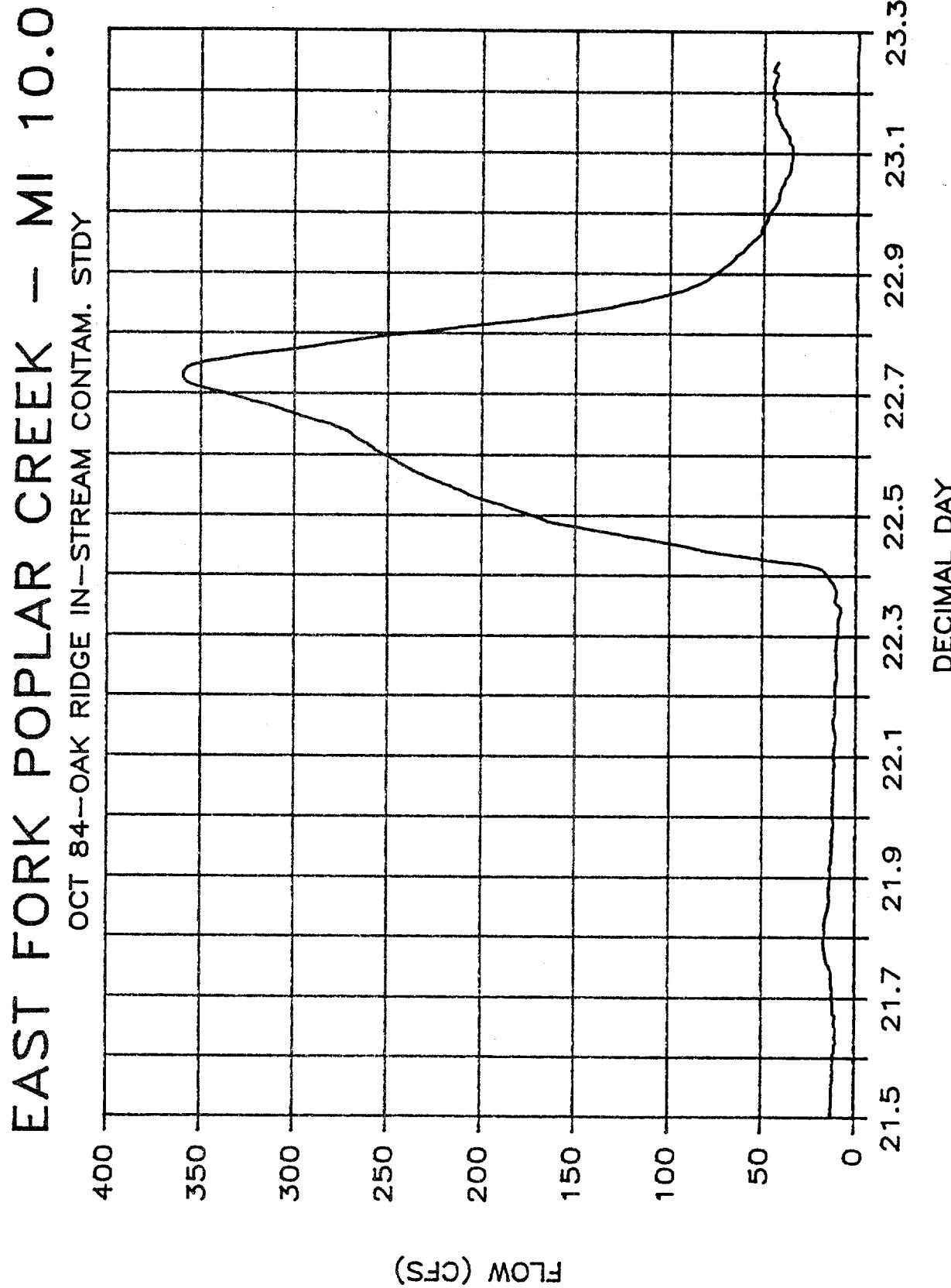
EAST FORK POPLAR CREEK - MI 3.3

OCT 84-OAK RIDGE IN-STREAM CONTAM. STDY



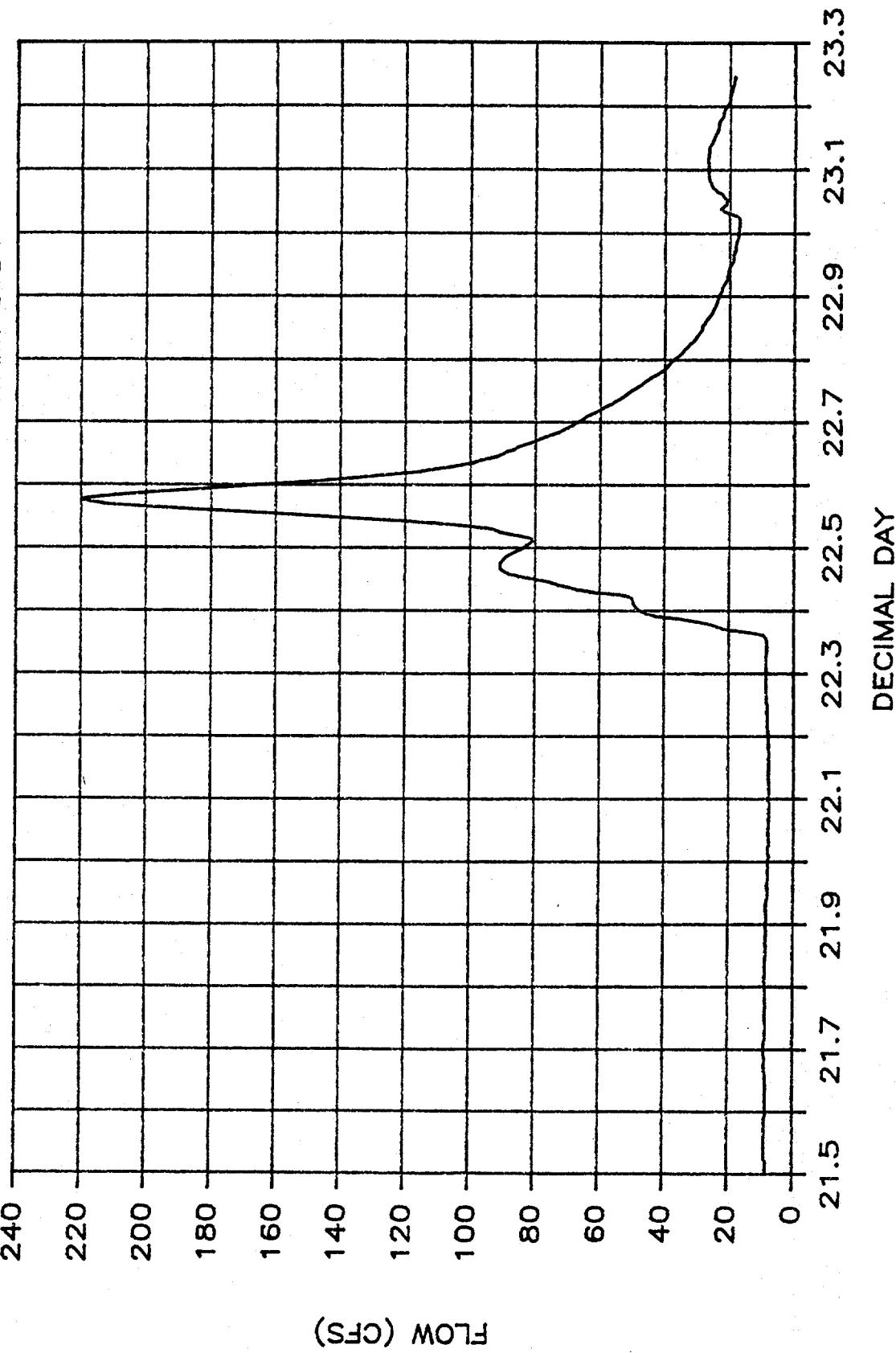
EAST FORK POPLAR CREEK - MI 6.89  
OCT 84-OAK RIDGE IN-STREAM CONTAM. STDY



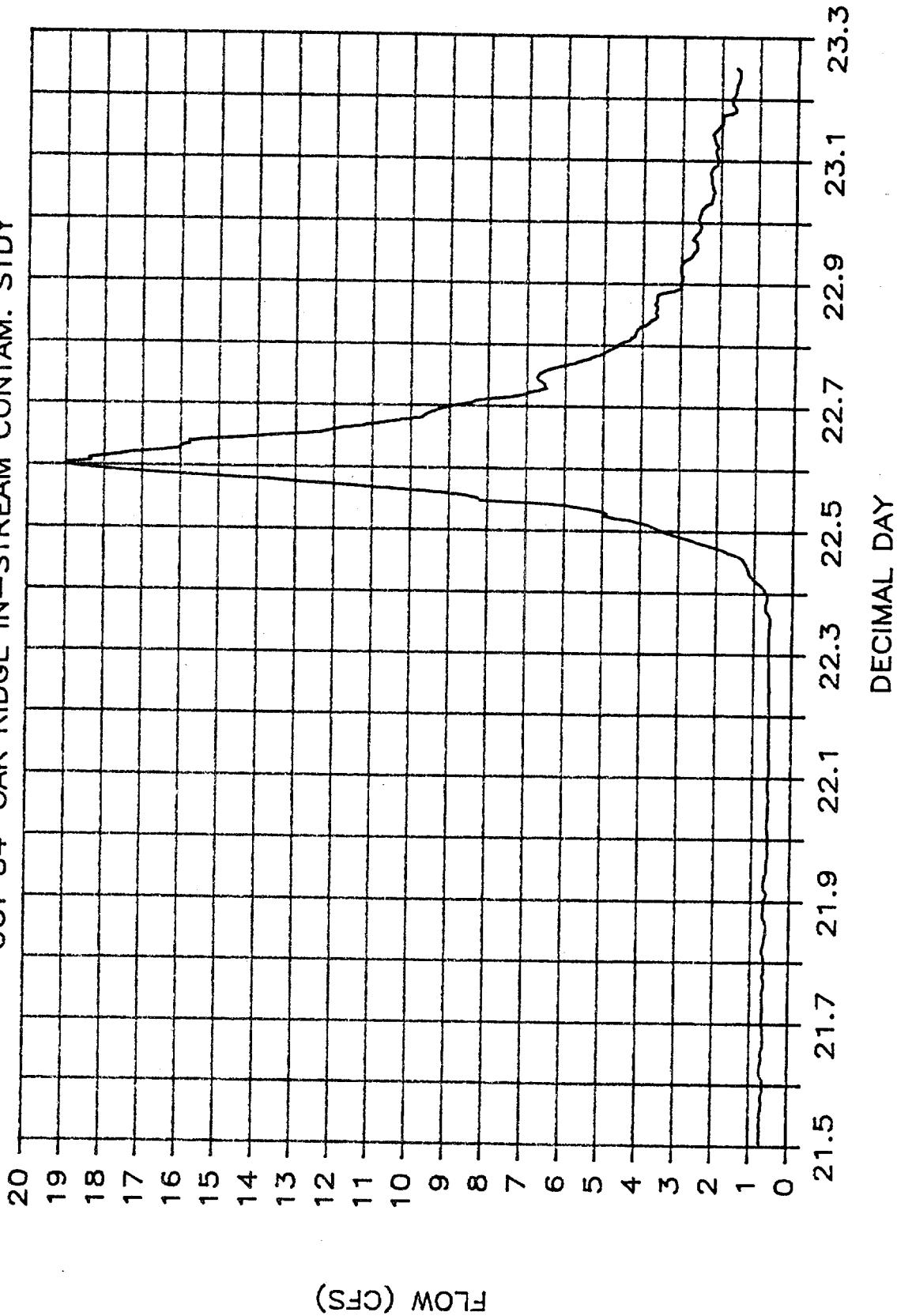


EAST FORK POPLAR CREEK - MI 14.4

OCT 84-OAK RIDGE IN-STREAM CONTAM. STDY



MILL BRANCH MI 0.2  
OCT 84-OAK RIDGE IN-STREAM CONTAM. STDY



BEAR CREEK MI 0.55  
OCT 84—OAK RIDGE IN-STREAM CONTAM. STDY

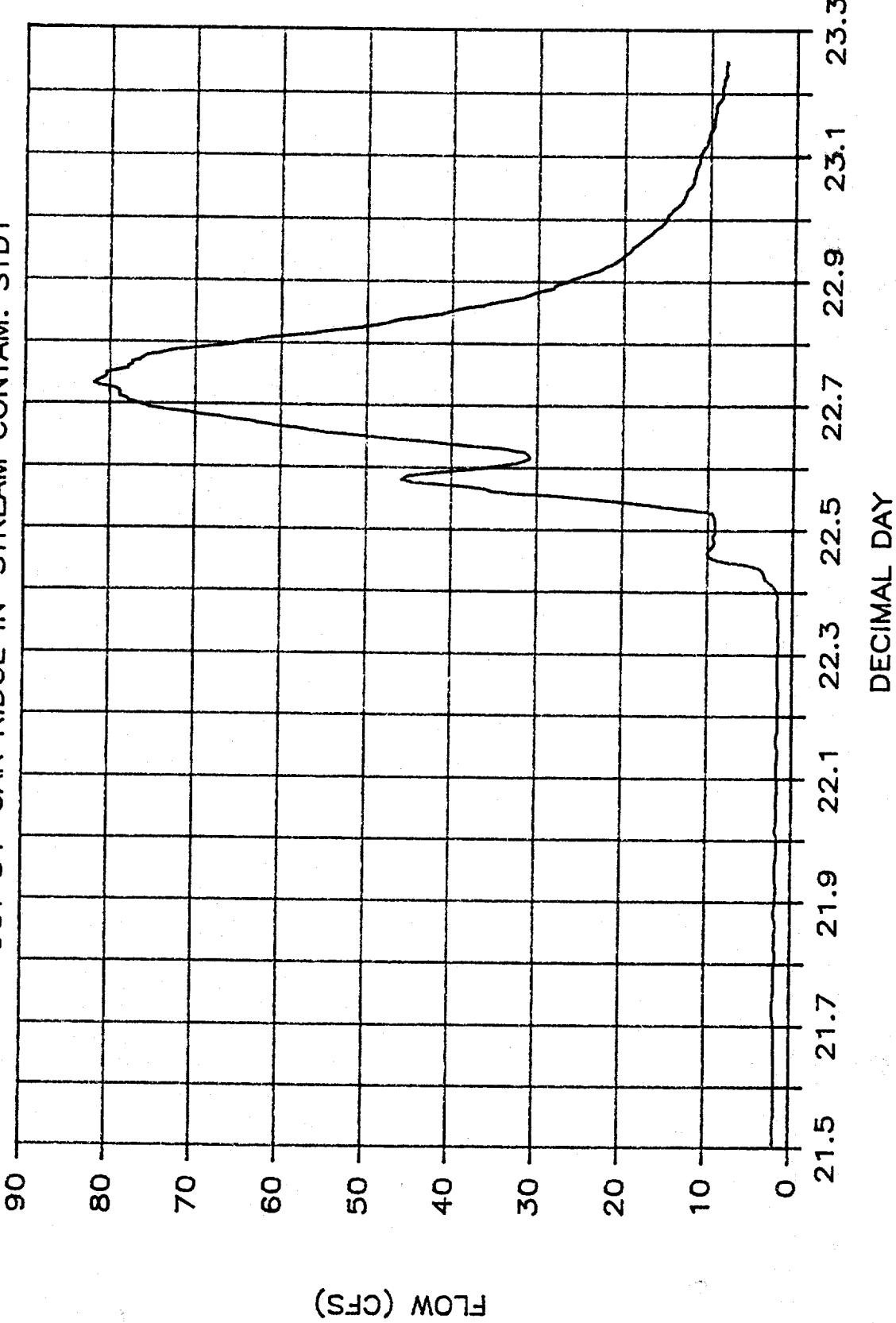
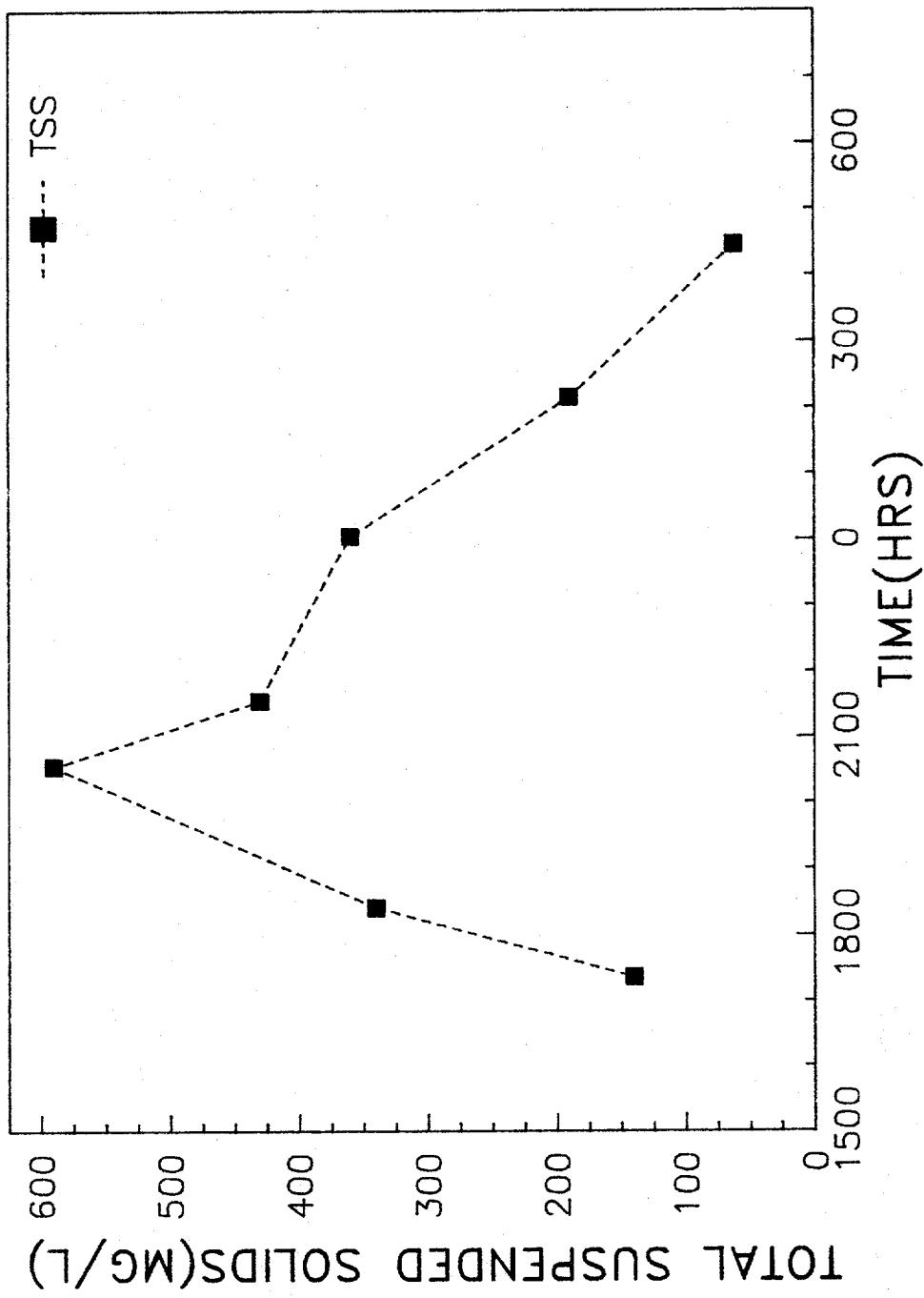


FIGURE 2

TOTAL SUSPENDED SOLIDS AND STREAMFLOW  
VERSUS TIME FOR DURATION OF FIRST STORM EVENT  
(OCTOBER 22-23, 1984)

INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-41-

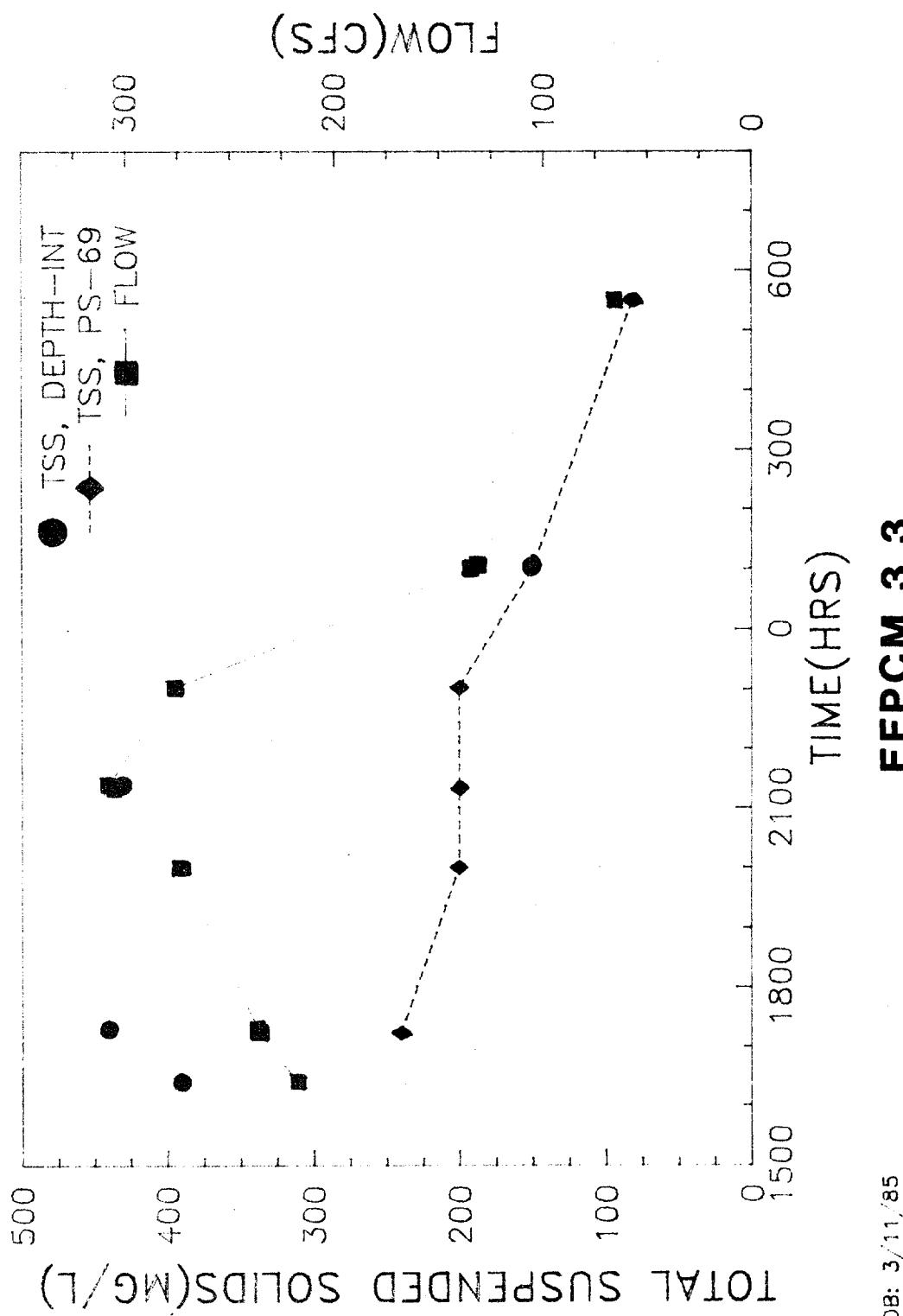


WSDB: 3/19/85

**EFPCM 0.03**

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-42-

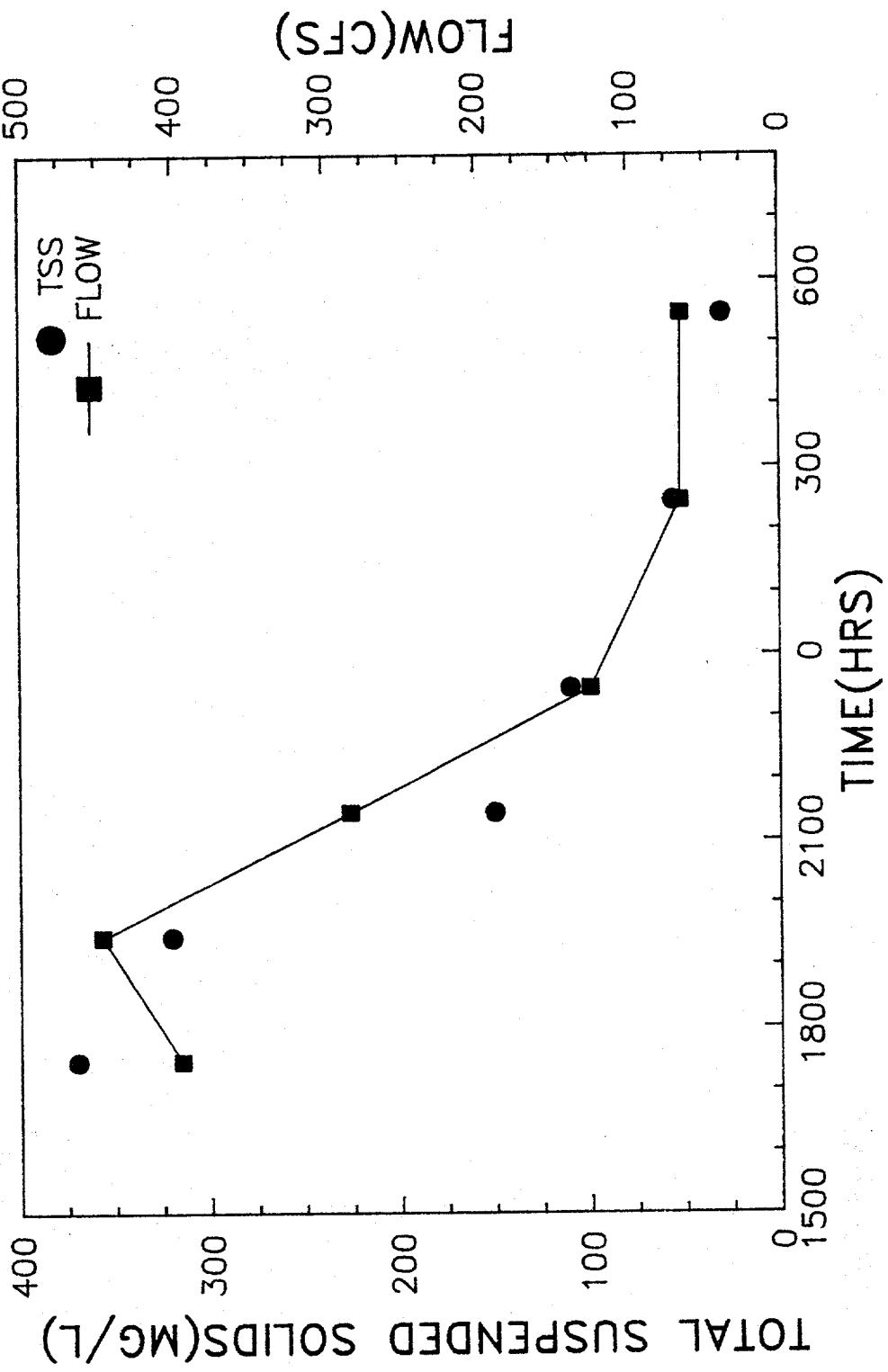


WSDB: 3/11/85

**EFPCM 3.3**

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-43-

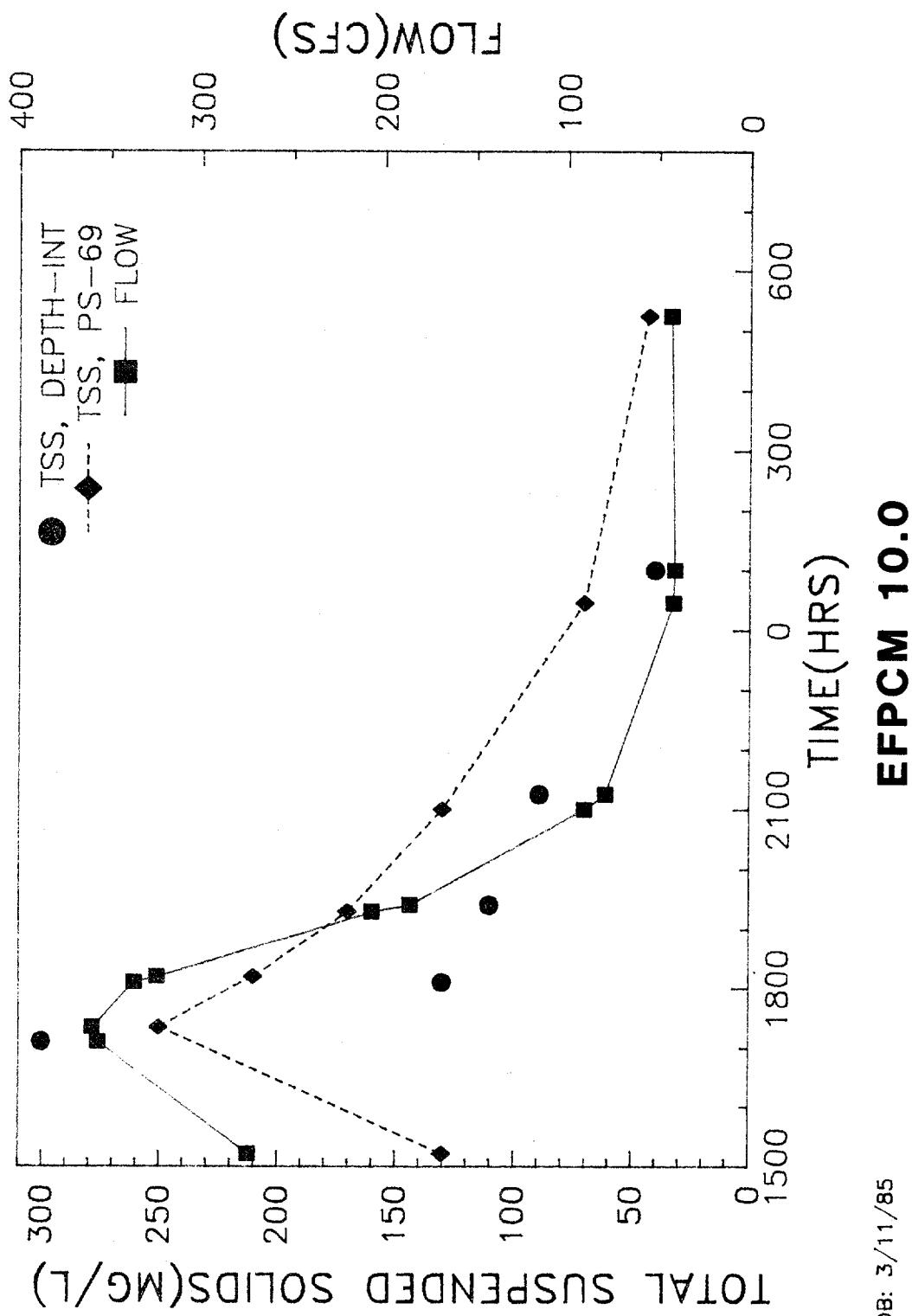


WSDB: 3/11/85

**EFPCM 6.8**

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-44-

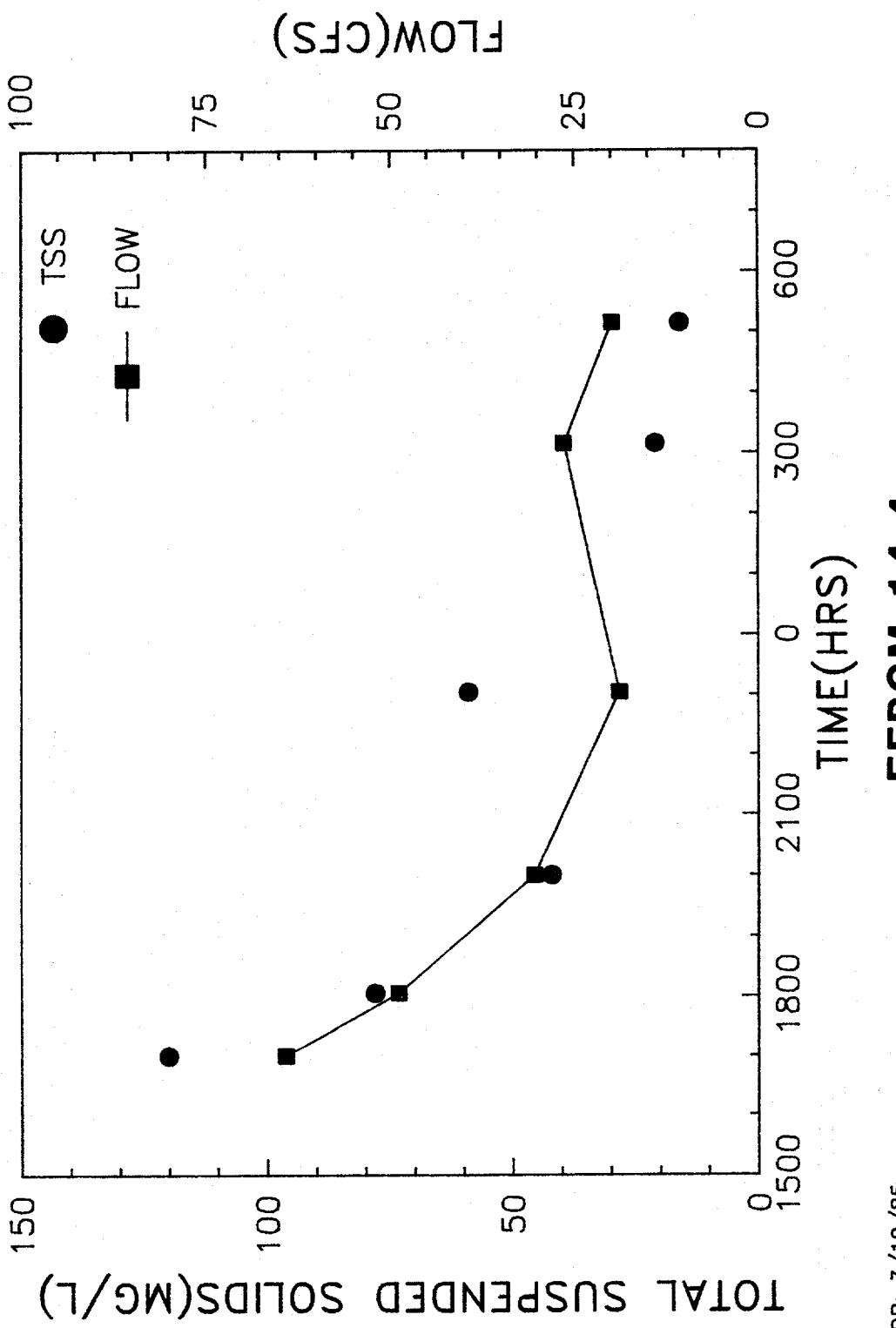


WSDB: 3/11/85

**EFP CM 10.0**

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-45-

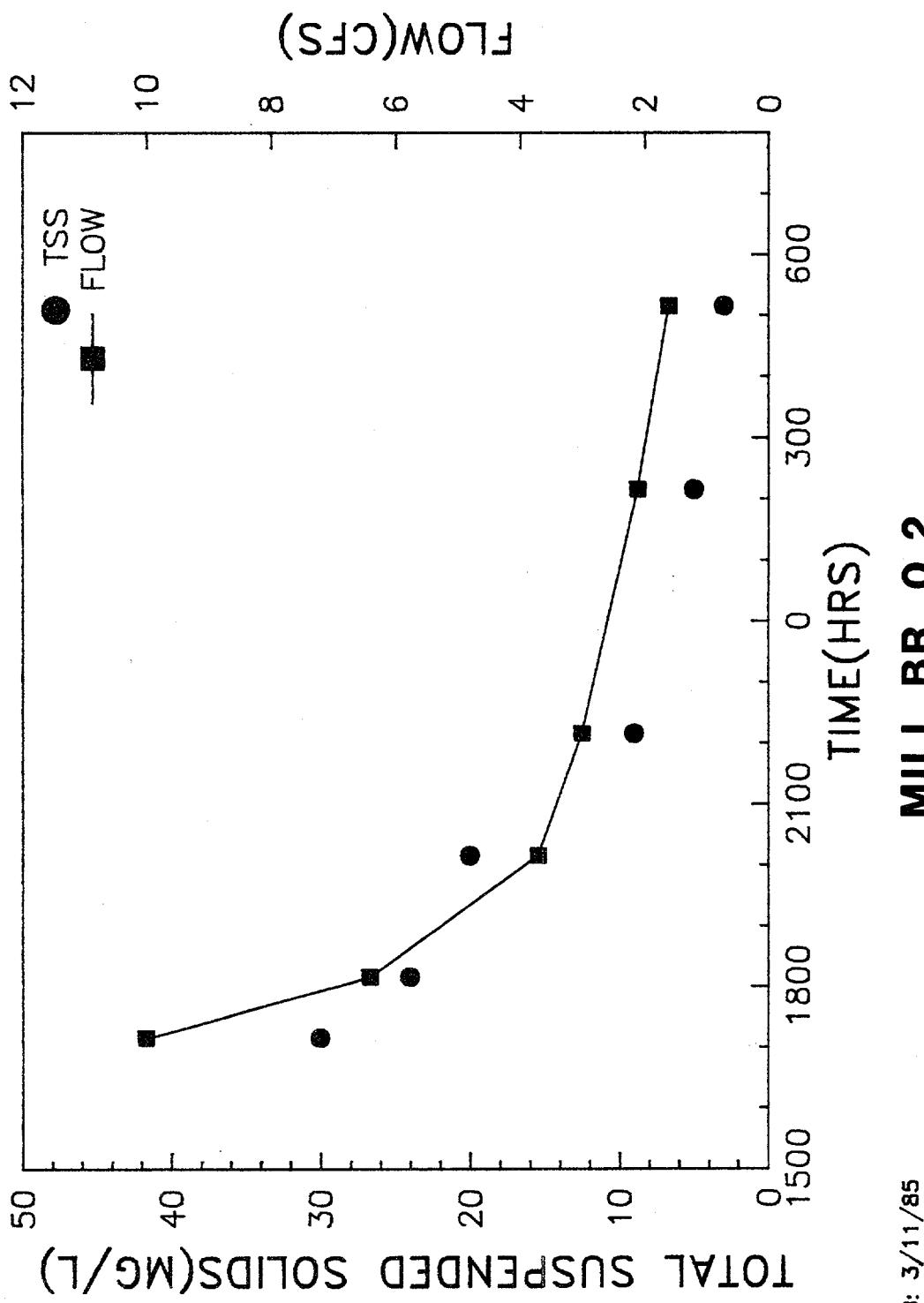


WSDDB: 3/19/85

**EFP CM 14.4**

INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-46-

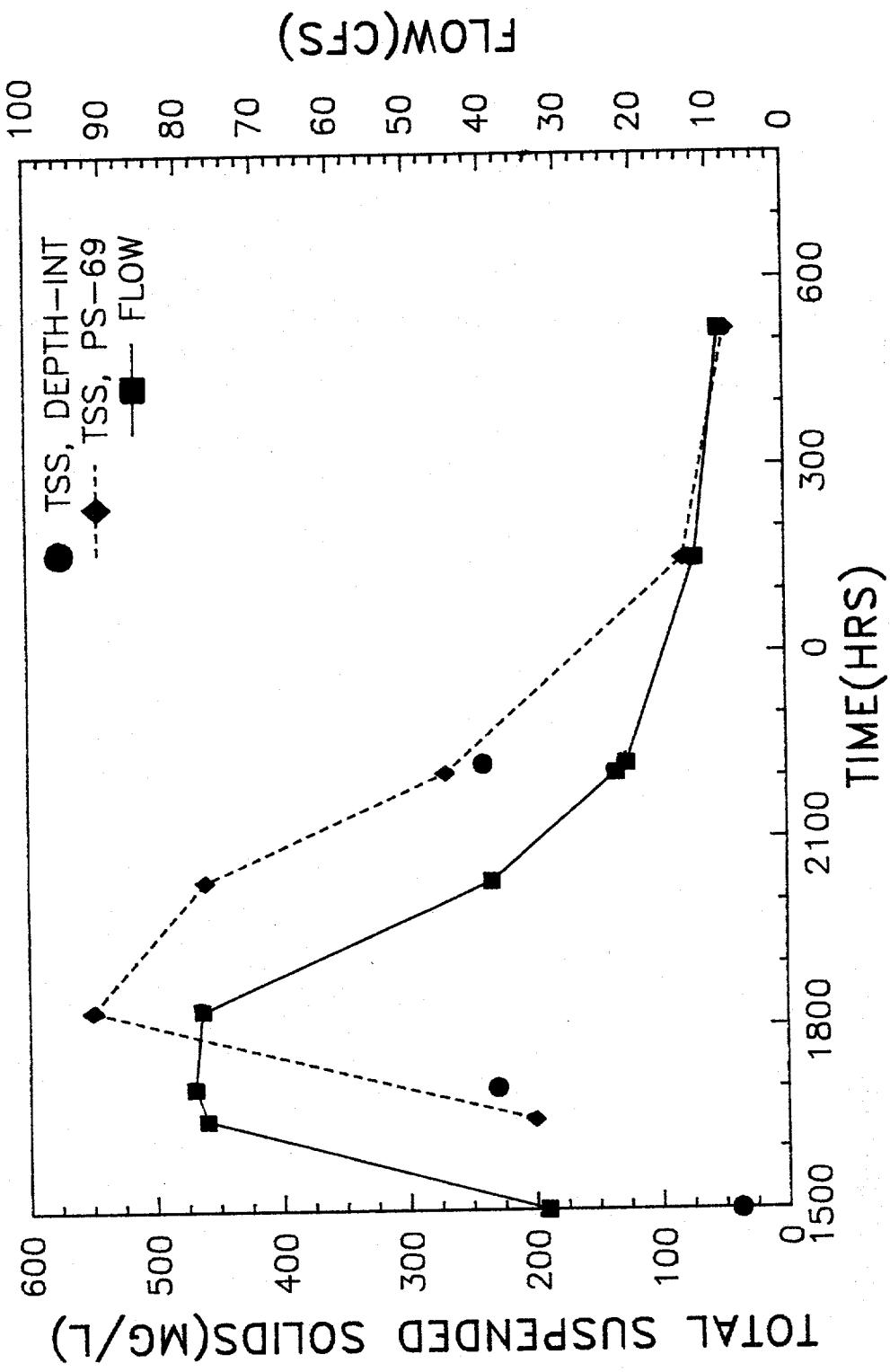


WSDB: 3/11/85

MILL BR. 0.2

INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-47-



WSDB: 3/11/85

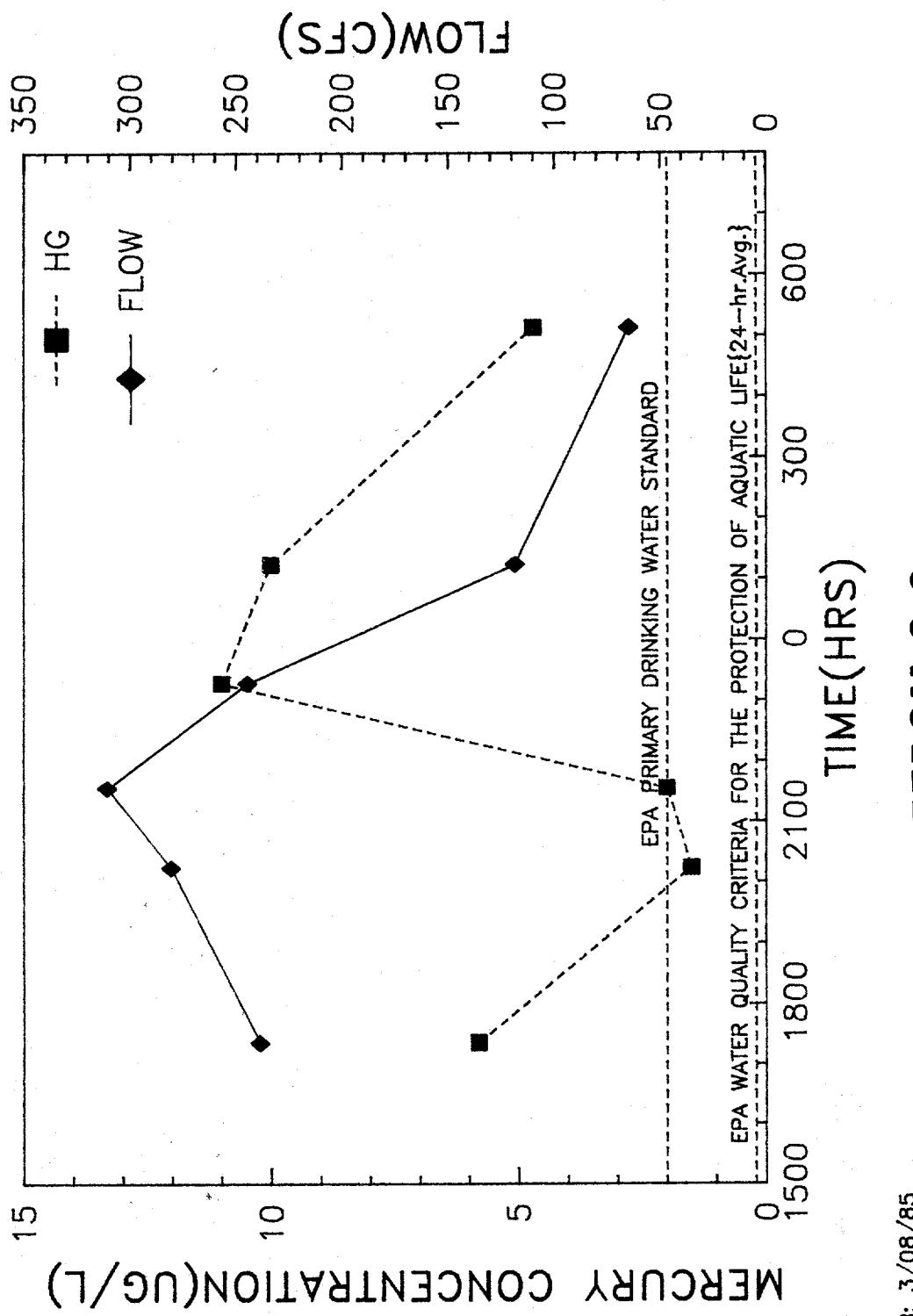
**BCM 0.55**

FIGURE 3

MERCURY AND STREAMFLOW VERSUS TIME FOR  
DURATION OF FIRST STORM EVENT  
(OCTOBER 22-23, 1984)

INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-49-

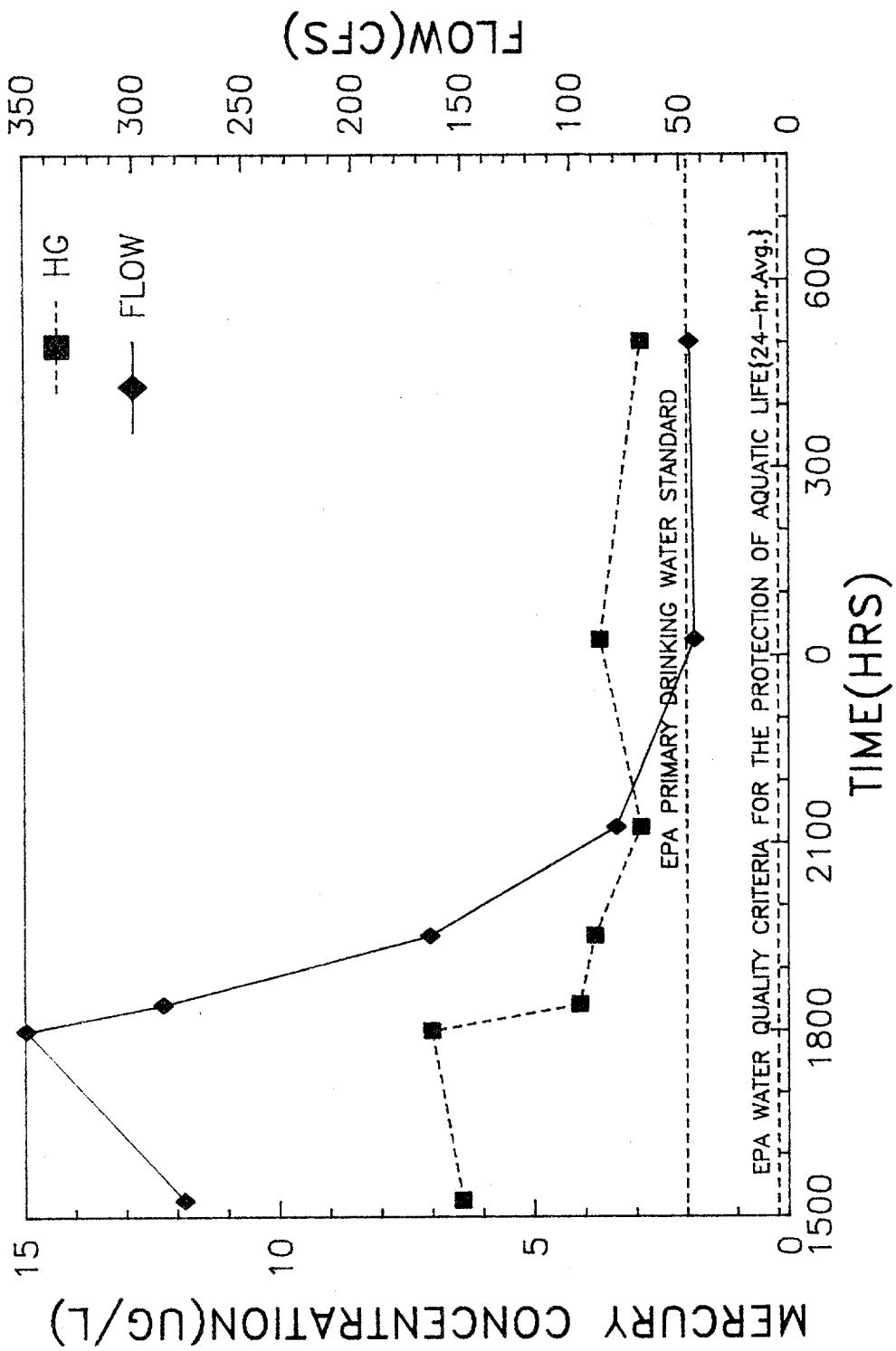


WSDB: 3/08/85

**EFPCM 3.3**

INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-50-

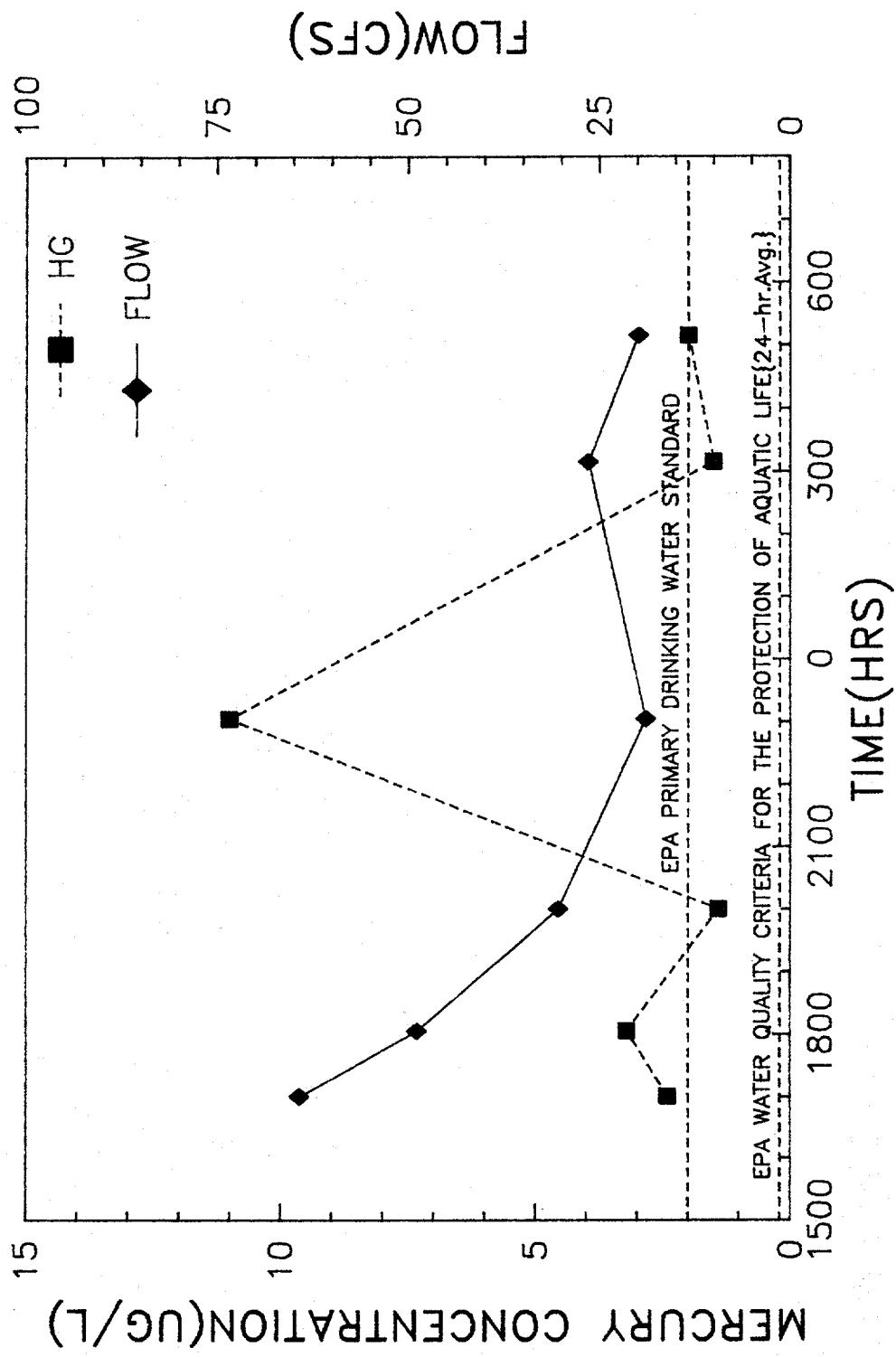


WSDB: 3/08/85

**EFP CM 10.0**

INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-51-

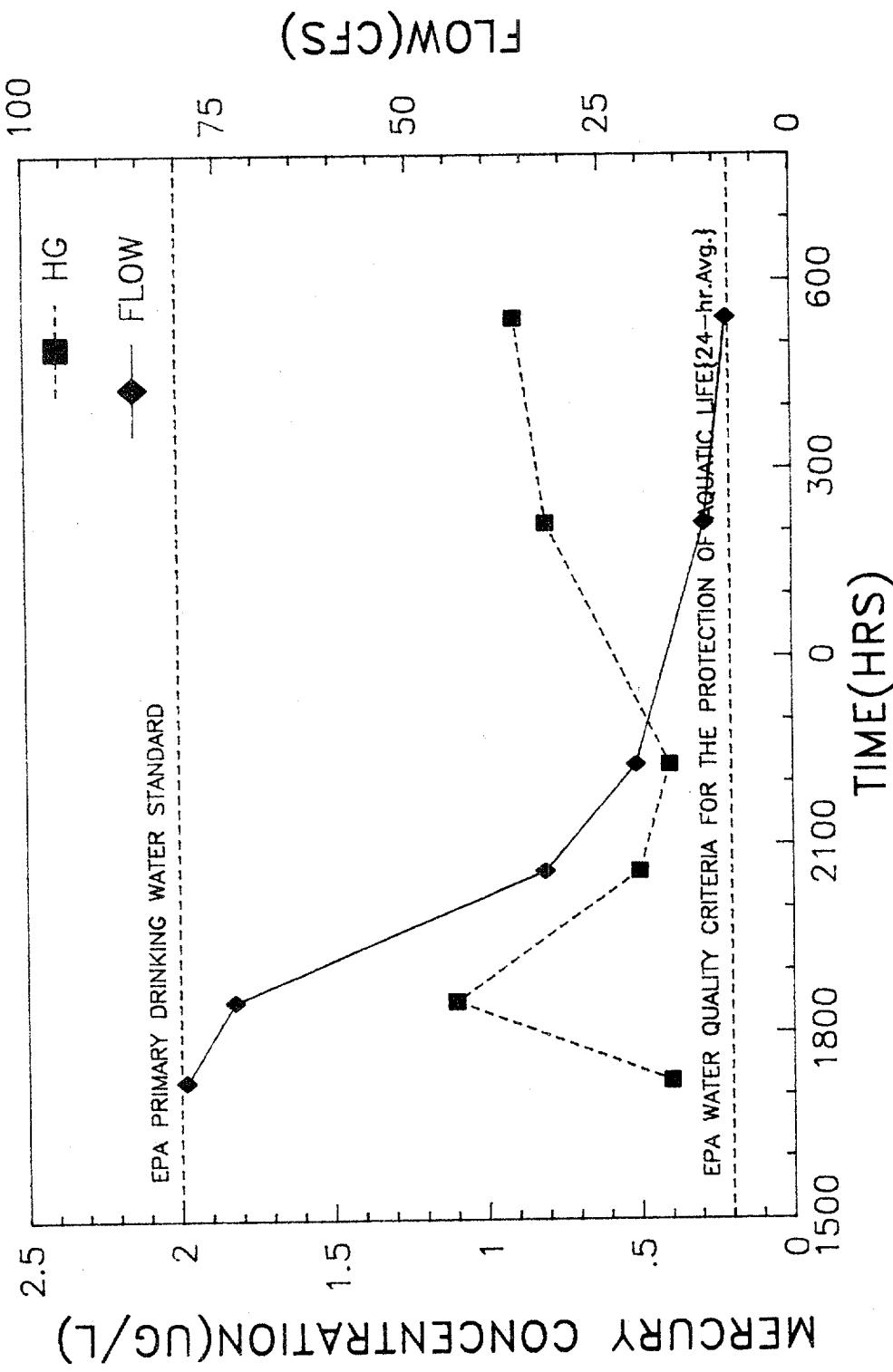


WSDB: 3/08/85

**EFP CM 14.4**

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-52-



WSDB: 3/08/85

**BCM 0.55**

**TABLE 1**  
**WATER AND BEDLOAD ANALYSES RESULTS - FIRST STORM**

STORE 1 REACH EVAL DATE: 10/04/13

47,6CC8  
 35 56 FR•0 0R4 23 13.0 2  
 TRIBUTARY TO POPPLAR CREEK 5.47  
 4714C TENNESSEE ROANE  
 CLINCH RIVER BASIN 040102  
 FAST FORK POPPLAR CREEK 0.03  
 132TVAC 841103

#TYPEA/STREAM

DATE	TIME	DEPTH	LAB	SERIES	00064	00062	00063	00065	82079	00530	00535	71821	00010
FRCM	OF	FT	DOCT.	CCC	X FRCM	X FRCM	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER	
TC	CAY	FEET	NUMBER	ALPHA	FT RANK	FT	SAMPLING	STAGE	LAR	TOT NFLT	GRAVITY	TEMP	
84/10/22	15	30			20	20	5						
	17	35			30	30	6						
	18	40			40	40	7						
	19	40			40X	40X	8						
	20	55			50	50	9						
	21	55			60	60	10						
	22	55			70	70	11						
84/10/23	00	05			80	80	12						
	01	05			90	90	13						
	02	15			100	100	14						
	03	25			110	110	15						
	04	45			120	120	16						
	06	15			130	130	17						
84/10/22	16	30											
(P(B)-G													
84/10/23	06	15											

84/10/22 15 30

DATE	TIME	DEPTH	LAB	SERIES	00064	00062	00063	00065	82079	00530	00535	71821	00010
FRCM	OF	FT	DOCT.	CCC	X FRCM	X FRCM	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER	
TC	CAY	FEET	NUMBER	ALPHA	FT RANK	FT	SAMPLING	STAGE	LAR	TOT NFLT	GRAVITY	TEMP	
84/10/22	15	30			20	20	5						
	17	35			30	30	6						
	18	40			40	40	7						
	19	40			40X	40X	8						
	20	55			50	50	9						
	21	55			60	60	10						
	22	55			70	70	11						
84/10/23	00	05			80	80	12						
	01	05			90	90	13						
	02	15			100	100	14						
	03	25			110	110	15						
	04	45			120	120	16						
	06	15			130	130	17						
84/10/22	16	30											
(P(B)-G													
84/10/23	06	15											

84/10/22 15 30

DATE	TIME	DEPTH	LAB	SERIES	00064	00062	00063	00065	82079	00530	00535	71821	00010
FRCM	OF	FT	DOCT.	CCC	X FRCM	X FRCM	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER	
TC	CAY	FEET	NUMBER	ALPHA	FT RANK	FT	SAMPLING	STAGE	LAR	TOT NFLT	GRAVITY	TEMP	
84/10/22	15	30			20	20	5						
	17	35			30	30	6						
	18	40			40	40	7						
	19	40			40X	40X	8						
	20	55			50	50	9						
	21	55			60	60	10						
	22	55			70	70	11						
84/10/23	00	05			80	80	12						
	01	05			90	90	13						
	02	15			100	100	14						
	03	25			110	110	15						
	04	45			120	120	16						
	06	15			130	130	17						
84/10/22	16	30											
(P(B)-G													
84/10/23	06	15											

84/10/22 15 30

-54-

2.04

260

DATE	TIME	DEPTH	LAB	SERIES	00064	00062	00063	00065	82079	00530	00535	71821	00010
FRCM	OF	FT	DOCT.	CCC	X FRCM	X FRCM	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER	
TC	CAY	FEET	NUMBER	ALPHA	FT RANK	FT	SAMPLING	STAGE	LAR	TOT NFLT	GRAVITY	TEMP	
84/10/22	15	30			20	20	5						
	17	35			30	30	6						
	18	40			40	40	7						
	19	40			40X	40X	8						
	20	55			50	50	9						
	21	55			60	60	10						
	22	55			70	70	11						
84/10/23	00	05			80	80	12						
	01	05			90	90	13						
	02	15			100	100	14						
	03	25			110	110	15						
	04	45			120	120	16						
	06	15			130	130	17						
84/10/22	16	30											
(P(B)-G													
84/10/23	06	15											

84/10/22 15 30

DATE	TIME	DEPTH	LAB	SERIES	00064	00062	00063	00065	82079	00530	00535	71821	00010
FRCM	OF	FT	DOCT.	CCC	X FRCM	X FRCM	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER	
TC	CAY	FEET	NUMBER	ALPHA	FT RANK	FT	SAMPLING	STAGE	LAR	TOT NFLT	GRAVITY	TEMP	
84/10/22	15	30			20	20	5						
	17	35			30	30	6						
	18	40			40	40	7						
	19	40			40X	40X	8						
	20	55			50	50	9						
	21	55			60	60	10						
	22	55			70	70	11						
84/10/23	00	05			80	80	12						
	01	05			90	90	13						
	02	15			100	100	14						
	03	25			110	110	15						
	04	45			120	120	16						
	06	15			130	130	17						
84/10/22	16	30											
(P(B)-G													
84/10/23	06	15											

84/10/22 15 30

DATE	TIME	DEPTH	LAB	SERIES	00064	00062	00063	00065	82079	00530	00535	71821	00010
FRCM	OF	FT	DOCT.	CCC	X FRCM	X FRCM	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER	
TC	CAY	FEET	NUMBER	ALPHA	FT RANK	FT	SAMPLING	STAGE	LAR	TOT NFLT	GRAVITY	TEMP	
84/10/22	15	30			20	20	5						
	17	35			30	30	6						
	18	40			40	40	7						
	19	40			40X	40X	8						
	20	55			50	50	9						
	21	55			60	60	10						
	22	55			70	70	11						
84/10/23	00	05			80	80	12						
	01	05			90	90	13						
	02	15			100	100	14						
	03	25			110	110	15						
	04	45			120	120	16						
	06	15			130	130	17						
84/10/22	16	30											
(P(B)-G													
84/10/23	06	15											

84/10/22 15 30

DATE	TIME	DEPTH	LAB	SERIES	00064	00062	00063	00065	82079	00530	00535	71821	00010
FRCM	OF	FT	DOCT.	CCC	X FRCM	X FRCM	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER	
TC	CAY	FEET	NUMBER	ALPHA	FT RANK	FT	SAMPLING	STAGE	LAR	TOT NFLT	GRAVITY	TEMP	
84/10/22	15	30			20	20	5						
	17	35			30	30	6						
	18	40			40	40	7						
	19	40			40X	40X	8						
	20	55			50	50	9						
	21	55			60	60	10						
	22	55			70	70	11						
84/10/23	00	05			80	80	12						
	01	05			90	90	13						
	02	15			100	100	14						
	03	25			110	110	15					</	

STORED RETRIEVAL DATE 85/09/10

476510  
 35 57 59.0 084 21 31.0 2  
 USGS GAGING STATION - BRIDGE 2.3 M NNE OF WHEAT  
 47145 TENNESSEE ROANE  
 CLINCH RIVER BASIN 04C102  
 EAST FORK POPLAR CREEK 3.3  
 132TVAC 840621

TYPE/APPENDIX/STREAM

DATE	TIME	DEPTH	LAB	SERIES	SAMPLE	NO. OF	TURBIDITY	RESIDUE	SPECIFIC	TEMP	CENT	CSN-RSP 0735371-0695329	
												DEPTH	
84/10/22	15 49			00008	84068	00063	00065	82079	00530	00535	71821	00010	
	17 20				15A	1	1	3.69	190.0	240	29		
	17 30				20	5	5	3.71		440			
	17 35				16A	1							
	19 45				19	10		3.89					
	19 54				26A	1	1	3.94	200.0	200	31		
	20 10				28	30		3.92					
	20 25				27A	1	1						
	20 50				38	60		3.97					
	21 25				4R	70		4.08					
	21 26				30A	1	1	4.05	200.0	200	28		
	21 34				10	5		4.08					
	21 50				5R	90		4.11					
	19 45												
CP(B)-05													
84/10/22	21 50												
	21 55												
	22 10												
	22 30												
	22 35												
	22 45												
	22 57												
	23 05												
	22 19												
CP(B)-04													
84/10/22	23 05												
	23 30												
	00 54												
	01 05												
	16 40												
CP(B)-03													
84/10/23	01 05												
	01 25												
	04 17												
	04 43												
CP(B)-02													
84/10/22	16 40												
CP(B)-01													
84/10/23	01 05												
	01 25												
	04 17												
	04 43												
CP(B)-00													
84/10/22	16 40												
CP(B)-05													
84/10/22	16 40												
CP(B)-04													
84/10/22	16 40												
CP(B)-03													
84/10/22	16 40												
CP(B)-02													
84/10/22	16 40												
CP(B)-01													
84/10/22	16 40												
CP(B)-00													
84/10/22	16 40												
CP(B)-05													
84/10/22	16 40												
CP(B)-04													
84/10/22	16 40												
CP(B)-03													
84/10/22	16 40												
CP(B)-02													
84/10/22	16 40												
CP(B)-01													
84/10/22	16 40												
CP(B)-00													
84/10/22	16 40												
CP(B)-05													
84/10/22	16 40												
CP(B)-04													
84/10/22	16 40												
CP(B)-03													
84/10/22	16 40												
CP(B)-02													
84/10/22	16 40												
CP(B)-01													
84/10/22	16 40												
CP(B)-00													
84/10/22	16 40												
CP(B)-05													
84/10/22	16 40												
CP(B)-04													
84/10/22	16 40												
CP(B)-03													
84/10/22	16 40												
CP(B)-02													
84/10/22	16 40												
CP(B)-01													
84/10/22	16 40												
CP(B)-00													
84/10/22	16 40												
CP(B)-05													
84/10/22	16 40												
CP(B)-04													
84/10/22	16 40												
CP(B)-03													
84/10/22	16 40												
CP(B)-02													
84/10/22	16 40												
CP(B)-01													
84/10/22	16 40												
CP(B)-00													
84/10/22	16 40												
CP(B)-05													
84/10/22	16 40												
CP(B)-04													
84/10/22	16 40												
CP(B)-03													

STORER REPORT DATE 45/09/19

47110  
34 57 58.0 084 21 31.0 ?

USGS GAGING STATION - BRIDGE 2.3 M NNE OF WHEAT  
47145 TENNESSEE  
CLINCH RIVER BASIN  
EAST FORK POPLAR CREEK 3.3  
132TVAC RA0501

STYFAS/STYFAN

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25	0.2U	1.5			
	15	45					
CP(B)-05							
84/10/22	21	50	0.2	2.0			
	21	55					
	22	10					
CP(B)-04							
84/10/22	23	05	0.3	11.0			
	23	30					
	16	40					
CP(B)-6							
84/10/23	C1	C5					
	C1	25	0.2U	10.0			
	04	10	0.2U	4.7			

DATE	TIME	DEPTH	MERCURY	802C3	80209	80327	80322
FROM	OF	FEET	HG+TSS	TCT SED	TOT SED	SUS PART	SUS PART
TO	DAY	FEET	U.S./L	SIEVE	SIEVE	> 63U	> 125U
84/10/22	17	35	0.3	5.8			
	29	25					

STORYTELLING FESTIVAL DATE 3/3/04 / 10

476, 9

35 58 56-0 084 1a 39-0 2  
ADJACENT TO OAK RIDGE COUNTRY CLUB  
47145 TENNESSE ROAN  
CLINCH RIVER BASIN 040102  
SOUTH FORK POPLAR CREEK 6-80

STATEMENT / STETSON

CSN-RSP 0735370-0695327  
1321WAC 840501Z  
0000 FEET CEPTH

IC	CAT	FEET	NUMBER	PERCENT	PER GROSS	PER TON
€4/10/22	17	45	10		3.75	370
	18	45	20		4.25	320
	19	45	30		4.35	
	20	45	40		4.19	150
	21	45	50		3.40	
	22	45	60		2.50	
	23	45	70		1.95	110
	24	45	80		1.60	
	01	45	90		1.40	
	02	45	100		1.25	
	03	45	110		1.15	
	04	45	120		1.12	
	05	45	130		1.20	
€4/10/22	17	45			56	30

149 1.79

-57-

DATE	TIME	DEPTH	MERCURY	TGT SED	TOT SED	TOT SED	SUS PART	SUS PART	80328
718-0	71900	MERCURY	TGT SED	TOT SED	TOT SED	TOT SED	SUS PART	SUS PART	80322
		HG,DISS	STEVE	STEVE	STEVE	STEVE	>125U	>125U	GT500UM
		HG TOTAL	HG/	SIEVE	SIEVE	SIEVE	X	X	MG/L
			HG/	X<125MM	X<125MM	X<125MM	X<500MM	X<500MM	MG/L
				X<062MM	X<062MM	X<062MM	X<200MM	X<200MM	MG/L

CP(H)-6  
E4/10/22 05 45

0.10

STORY RELEVANT DATA 04/10

47659  
35 57 57.0 084 18 00.6 1

BRIDGE AT WILSHIRE

47001 TENNESSEE  
CLINCH RIVER BASIN 040102

RAST FORK POPLAR CREEK 10.0

152 TWAC 840601

0000 FEET DEPTH

CSN-RSP 0735369-0695324

DATE	TIME	DEPTH	LAB	SERIES	00002	00003	00005	00535	00535
FRCT	CF	FEET	DEFNT.	CCCE	FSAMPLOC	% FRCM	STREAM	TURBIDITY	RESIDUE
TC	CAY	FEET	NUMBER	ALPHA	RT HANK	RT HANK	STAGE,	LAH	VOL NFLT
84/10/22	15 15	4A			1	1	1	71821	00019
	15 20	5A			1R	20	3.78	WATER	
	15 25	2A			2A	4.0	3.78	SPECIFIC	
	16 40	3B			3B	5.0	4.00	TEMP	
	17 00	4B			4B	7.0	4.08	SEDIMENT	
	17 10	1D			1D	8.	4.10		
	17 15	5B			5B	9.0	4.14		
	15 00								
CP(B)-04									2.024
84/10/22	17 15	23A			1	1	1	250.0	250
	17 25	6B			6B	2.0	1	32	
	17 35	24A			24A	40	4.18		
	17 45	7B			7B	50	4.20		
	17 50	4082210R			1R	50	1	31	
	18 05	25A			25A	50	4.08		
	18 09	20			20	50	4.04		
	18 10	8B			8B	50	4.04		
	18 11	9B			9B	7.0			
	18 25								
	17 25								
CP(B)-04									2.18
84/10/22	18 25	26A			1	1	1	200.0	170
	18 30	28A			30A	5.	3.08		110
	19 15	30			30	5.			
	19 45	29A			29A	1	1		
	19 41	32A			32A	1	1		20
	20 50	33A			33A	1	1		
	21 10	40			40	5.	1.75		
	21 25	41A			41A	1	1		
	09 15	42A			42A	1	1		
	09 40	50			50	5.	1.10		
84/10/22	17 15							80.0	70
	17 10							40	40
CP(B)-04									114

STORE RETRIEVAL DATE 35/34/10

476509

35 59 55.0 094 18 00-6 1  
 BINGER AT WILTSIRE  
 47001 TENNESSEE ANGERSON  
 CLINCH RIVER HASTIN 04C102  
 EAST FORK POPLAR CREEK 10-0  
 132IVAC R40601  
 9000 FEET DEPTH CSN-RSP 0735369-0695324  
 /TYPE/AMENT/STREAM  
 DATE TIME DEPTH  
 FROM OF IDENT.  
 T.C. RAY FFFI  
 00008 00006  
 LAB SERIES  
 CCCS HSAMPLEC  
 2 FROM SAMPLING  
 61 RANK EONTNS  
 00053 NO. OF STAGE  
 00535 TURHDY RESIDUE  
 71821 LAR TOT NFLT  
 00010 SPECIFIC GRAVITY  
 WATER TEMP  
 SEGM/GM  
 SEAT

64/110/23 04 55 51A 1 50.0 43 11

DATE	TIME	DEPTH OF CAV	MERCURY Hg • DISS FEET	Hg • TOTAL UG/L	ICR SED STEVE x .062MM	TCT SED STEVE x <1.25MM	80204 STEVE x <500MM	80206 STEVE x <2.00MM	80208 TOT SED STEVE LT6-35MM	80325 TOT SED STEVE LT6-35MM	80322 SUS PART MG/L
FRCP TC	71900	80203	MERCURY Hg • DISS FEET	71900 Hg • TOTAL UG/L	80204 STEVE x .062MM	80206 STEVE x <1.25MM	80208 STEVE x <500MM	80208 STEVE x <2.00MM	80325 TOT SED STEVE LT6-35MM	80325 TOT SED STEVE LT6-35MM	80322 SUS PART MG/L

84/10/22 15 20 0.7 6.4

59-

8

DATE	TIME	DEPTH	MPA	234	21511	29301	28302
FR CM	OF	TOTAL			I-111	I-111	
TO	CAY	FEET			1 CIAL	ERRCF	
		ERRGR			FC/L	PC/L	

178

STORED RETRIEVAL DATE 45/04/10

476507

**476507** 35 59 49.3 084 14 27.3 1  
BLOW NEW HOPE POND DIVERSION POINT  
**47001** TENNESSFF ANDFRSON  
CLINCH RIVER BASIN 04 0102  
FAST FORK POPLAR CREEK 14.36  
SOUTHERN CALIFORNIA

/ TYPES / APPENDIX / STREAM

CSN-RSP 0733558-0573521  
0000 FTEI DEPTH  
000065 82079 00530  
000063 STREAM TURBIDITY RESIDUE  
00002 N. OF STAGE LAB TOT NF LT  
+SAMPLE LOC X FROM SAMPLING  
SERIES CODE FEET NTU  
84068 LAB IDENT. NUMBER  
00008 LAB IDENT. NUMBER  
DATE TIME DEPTH OF FROM FAY EFFE I  
00008 LAB IDENT. NUMBER  
00008 LAB IDENT. NUMBER

DATE	TIME	PERIOD	ACTUAL	DESIRED	PERCENTAGE	PERIOD	ACTUAL	DESIRED	PERCENTAGE
84/10/22	17 00	4082228R	10	50		3	1.03	130.0	120
	17 20		1R			3	1.00	100.0	78
	18 05		2D			3	0.89	100.0	55.0
	20 05		3D			3	0.60	55.0	42
	21 00		4D			3	0.50	45.0	10
	22 00		5D			3	0.45	45.0	
	23 04		6D			3	0.40	59	11
	00 05		7D			3	0.38		
	01 10		8D			3	0.48		
	02 13		9D			3	0.58		
	03 15		10C			3	0.55	17.0	7
	04 15		11C			3	0.46	13.0	10
	05 15		12C			3	0.42		
84/10/22	17 00	(P(R)-6				3			53

IC	CAT	LLC	CCU	SCU	ECU
84/10/22	17	30	0.2U	2.4	
	18	05	0.2U	3.2	
	20	00	0.6U	1.4	
	23	04	0.2	11.0	
84/10/22	03	15	0.2U	1.5	
	05	15	0.3	2.0	

$\mu_{\text{eff}}$	$\mu_{\text{eff}}$	$\mu_{\text{eff}}$
0.4 / 1.0 / 2.2	1.7	2.9
$\text{CP}(\text{B}) - 6$	1.7	0

STORED RETRIEVAL DATE 45/04/10

476512  
35 63 45.0 094 18 03.0 2  
TRIBUTARY TO EAST FORK POPLAR CREEK 9.66.  
47001 TENNESSEE ANCESSION  
CLINCH RIVER BASIN  
MILL BRANCH 0.20  
152TVA R4 0501  
0000 FEET DEPTH

STYFA/AMENT/STREAM

DATE	TIME	DEPTH	LAB IDENT.	SERIES CODE	PSAMPLECC	00002	00063	00065	82079	00530	00535	71821	00010
FR CM	OF DAY	FEET		ALPHA	1 FROM RT RANK	NO. OF SAMPLING POINTS	STAGE FEET	STREAM STAGE	TURBIDITY LAR	RESIDUE TOT NFLT	SPFCIFIC VOL NFLT	WATER TEMP	CENT
84/10/22	17 15	10											
	18 15	20											
	19 15	30											
	20 15	40											
	21 15	50											
	22 15	60											
	23 15	70											
	00 15	80											
	01 15	90											
	02 15	100											
	03 15	110											
	04 15	120											
	05 15	130											
	06 15	140											
84/10/22	17 15												
CP(R)-6													
84/10/23	06 15												

DATE	TIME	DEPTH	LAB IDENT.	SERIES CODE	PSAMPLECC	00009	84068	00002	00063	00065	82079	00530	00535	71821	00010
FR CM	OF DAY	FEET		ALPHA	1 FROM RT RANK	NO. OF SAMPLING POINTS	STAGE FEET	STREAM STAGE	TURBIDITY LAR	RESIDUE TOT NFLT	SPFCIFIC VOL NFLT	WATER TEMP	CENT		
84/10/22	17 15	10													
	18 15	20													
	19 15	30													
	20 15	40													
	21 15	50													
	22 15	60													
	23 15	70													
	00 15	80													
	01 15	90													
	02 15	100													
	03 15	110													
	04 15	120													
	05 15	130													
	06 15	140													
84/10/22	17 15														
CP(R)-6															
84/10/23	06 15														

DATE	TIME	DEPTH	LAB IDENT.	SERIES CODE	PSAMPLECC	71890	80203	80204	80205	80206	80208	80327	80325	80322	80328
FR CM	OF DAY	FEET		ALPHA	1 FROM RT RANK	MERCURY HG TOTAL	TCT SED STEVE	TOT SED STEVE	TOT SED STEVE	TOT SED STEVE	SUS PART SUS PART				
84/10/22	17 15														
CP(H)-6															
84/10/23	06 15														

DATE	TIME	DEPTH	LAB IDENT.	SERIES CODE	PSAMPLECC	80326	01501	01502	03501	03502	22383	22384	17519	17520	
FR CM	OF DAY	FEET		ALPHA	1 FROM RT RANK	ALPHA	TOTAL	ALPHA	NETA-T	NETA-T	BI-214	PB-214	PB-214	PB-214	
84/10/22	17 15														
CP(H)-6															
84/10/23	06 15														

STORED RETRIEVAL DATE: 05/04/10

4715  
35 56 43.4 084 22 01-? 1

TOP STREAM FROM THE INFLUENCE OF EPPC BACKWATER  
47145 TENNESSEE  
CLINCH RIVER BASIN  
HIFAR CREEK 0.55  
132TWAC 840601  
0000 FEET DEPTH

CSN-RSP 0735375-0695338

**TYPE/AMENT/STREAM**

DATE	TIME	DEPTH	LAB	SERIES	PSAMPLED	N. OF	00002	000363	00055	02079	00530	00535	71921	00010
FROM	OF	FEET	INCNT.	CCE	> FRM	SAMPLING	STAGE	STREAM	TURBIDITY	RESIDUE	RESIDUE	SPECIFIC	WATER	
TC	DAY	FEET	ALPHA	FI	RANK	POINTS	FEET	LAR	LAR	VOL NFLT	MG/L	GRAVITY	TEMP	
84/10/22	15	CU			10									
	16	55			10A			1	1	160.0	200	29		
	17	00			20						230			
	17	20			13A			1	1.90					
	17	25	40821948		1R	50		1	1.90					
	18	50			15A									
	18	50			17A			1						
	20	30			24A				1					
	20	55			25A				1					
	22	05			28A				1					
	22	20			30				1					
	15	00												

CP(B)-6

DATE	TIME	DEPTH	MERCURY	MERCURY	TCT SED	TOT SED	80204	80206	80208	80327	80325	80322	80328
FROM	OF	HG DISS	HG TOTAL	HG TOTAL	SIEVE	SIEVE				SUS PART	SUS PART	SUS PART	SUS PART
TC	DAY	FEET	UG/L	UG/L	%<.062MM	%<.125MM				>63U	>63U	>125U	>125U
84/10/22	17	20			0.2U	0.4							
	18	50			0.2	1.1							
	20	55			0.2U	0.5							
	15	00											

CP(H)-6

DATE	TIME	DEPTH	MERCURY	MERCURY	TCT SED	TOT SED	80204	80206	80208	80327	80325	80322	80328
FROM	OF	HG DISS	HG TOTAL	HG TOTAL	SIEVE	SIEVE				SUS PART	SUS PART	SUS PART	SUS PART
TC	DAY	FEET	UG/L	UG/L	%<.062MM	%<.125MM				>63U	>63U	>125U	>125U
84/10/22	22	20			0.2U	0.4							
	22	25			0.2U	0.8							
	02	15			0.7	0.9							
	05	15											
	05	40											

DATE	TIME	DEPTH	SUS PART	SUS PART	01501	01502	03501	03502	02383	RI-214	17519	17520	21510
FROM	OF	FEET	UG/L	UG/L	ALPHA-T	ALPHA-T	BETA-T	BETA-T	RI-214	TOTAL	TOTAL	PB-214	MPA-234
TC	DAY	FEET	PC/L	PC/L	ERRRCF	ERRRCF	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L
84/10/22	17	25											
	15	25											
	03	40											

CP(E)-6

CP(E)-6

CP(E)-6

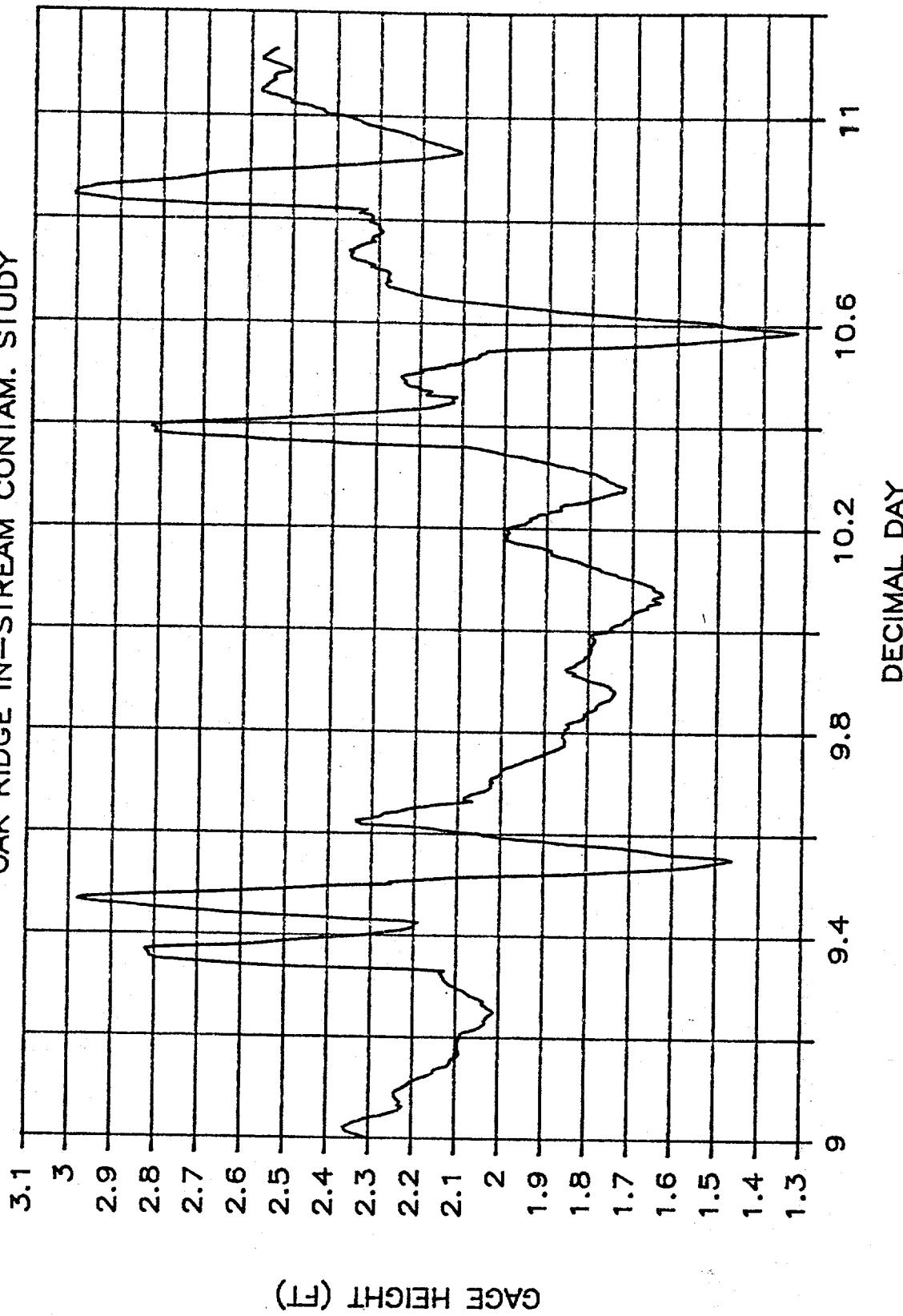
**APPENDIX III**  
**INSTREAM CONTAMINANT STUDY - TASK 1**  
**STORMFLOW SURVEY RESULTS - SECOND STORM**

**FIGURE 1**  
**STREAMFLOW RESULTS - SECOND STORM**

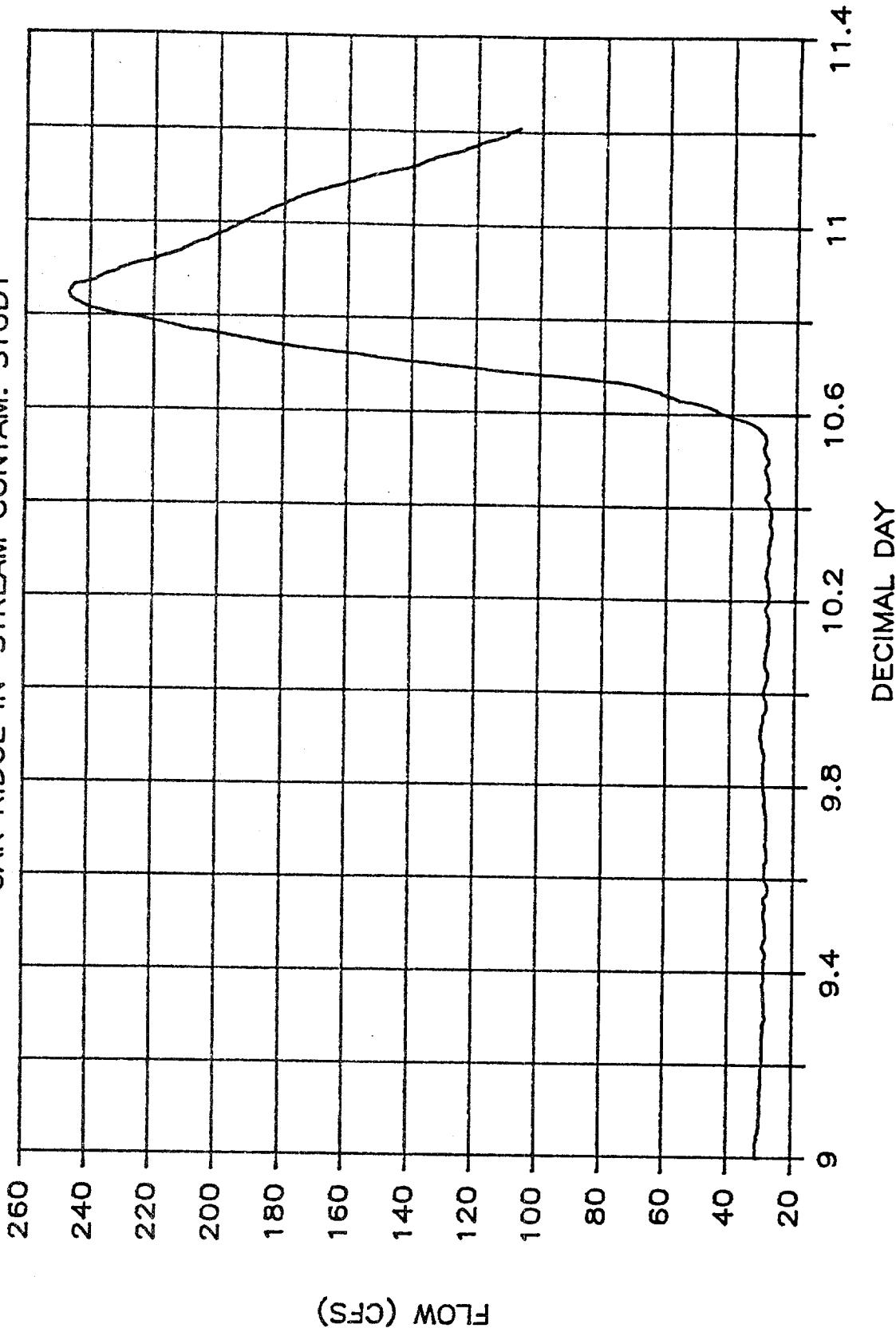
E. FK. POPLAR CR. MI. 0.03 - NOV. 1984

OAK RIDGE IN-STREAM CONTAM. STUDY

-65-



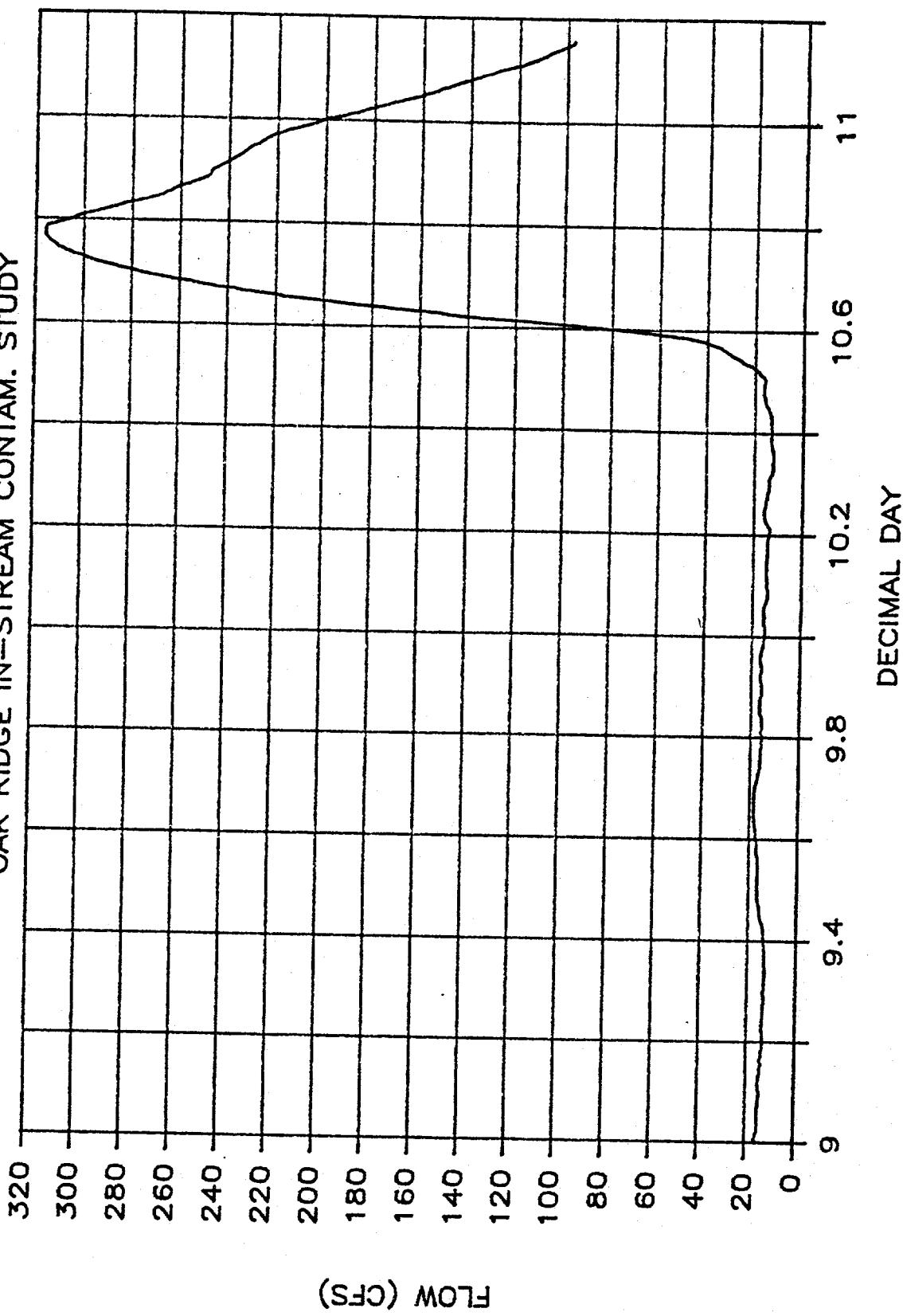
E. FK. POPLAR CR. MI. 3.3 - NOV. 1984  
OAK RIDGE IN-STREAM CONTAM. STUDY



E. FK. POPLAR CR. MI. 6.89 - NOV. 1984

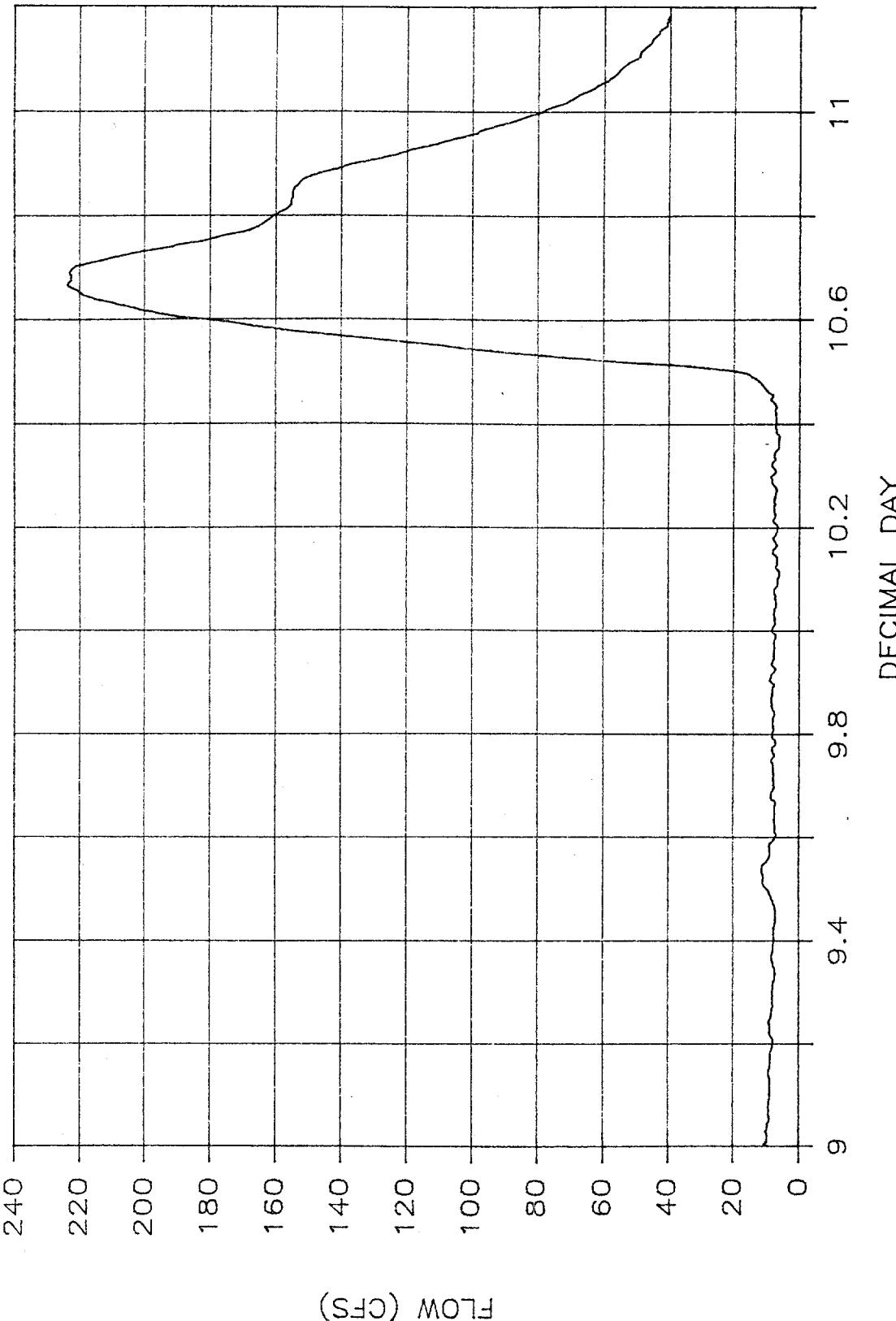
OAK RIDGE IN-STREAM CONTAM. STUDY

-67-



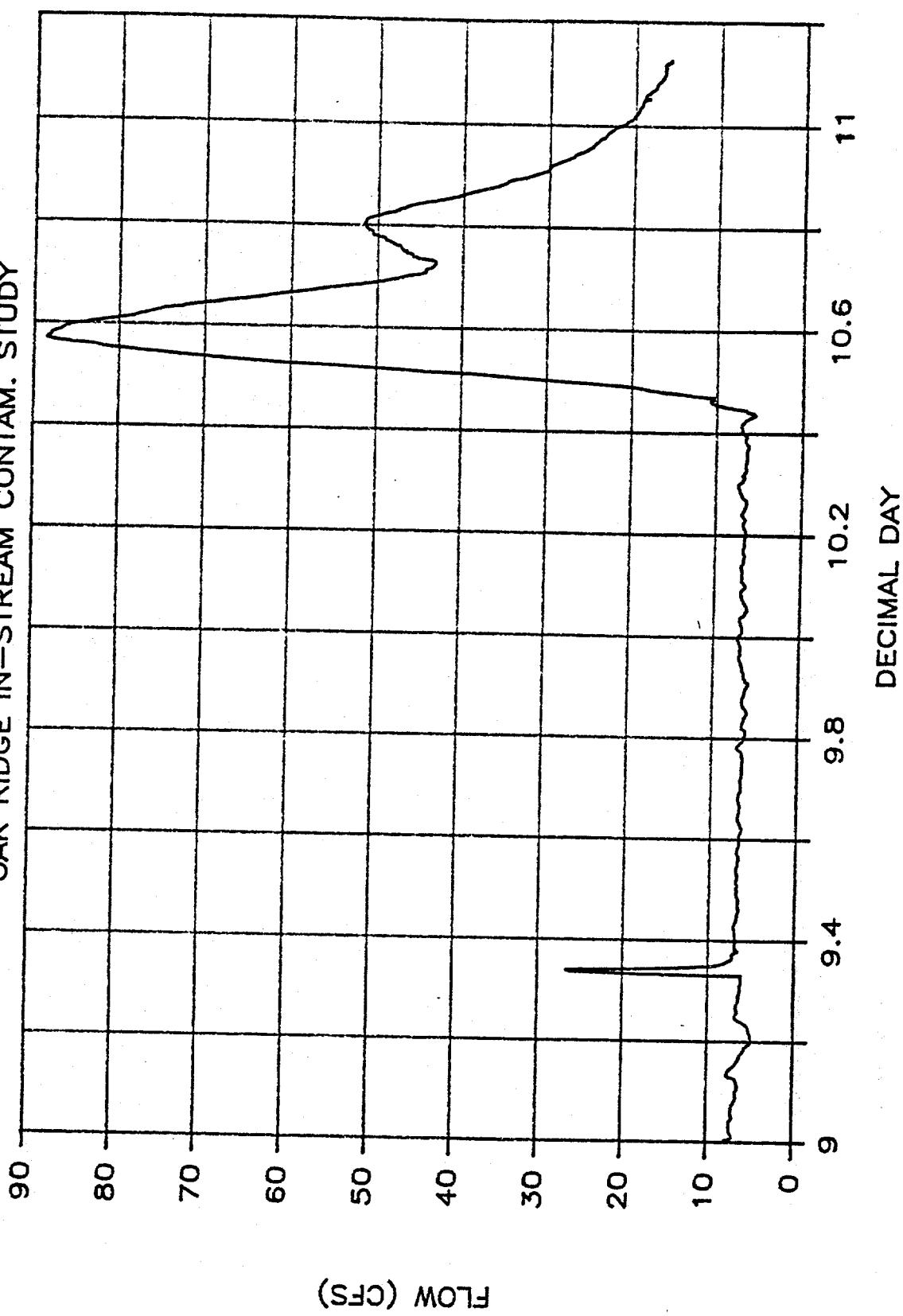
E. FK. POPLAR CR. MI. 10.0 - NOV. 1984

OAK RIDGE IN-STREAM CONTAM. STUDY

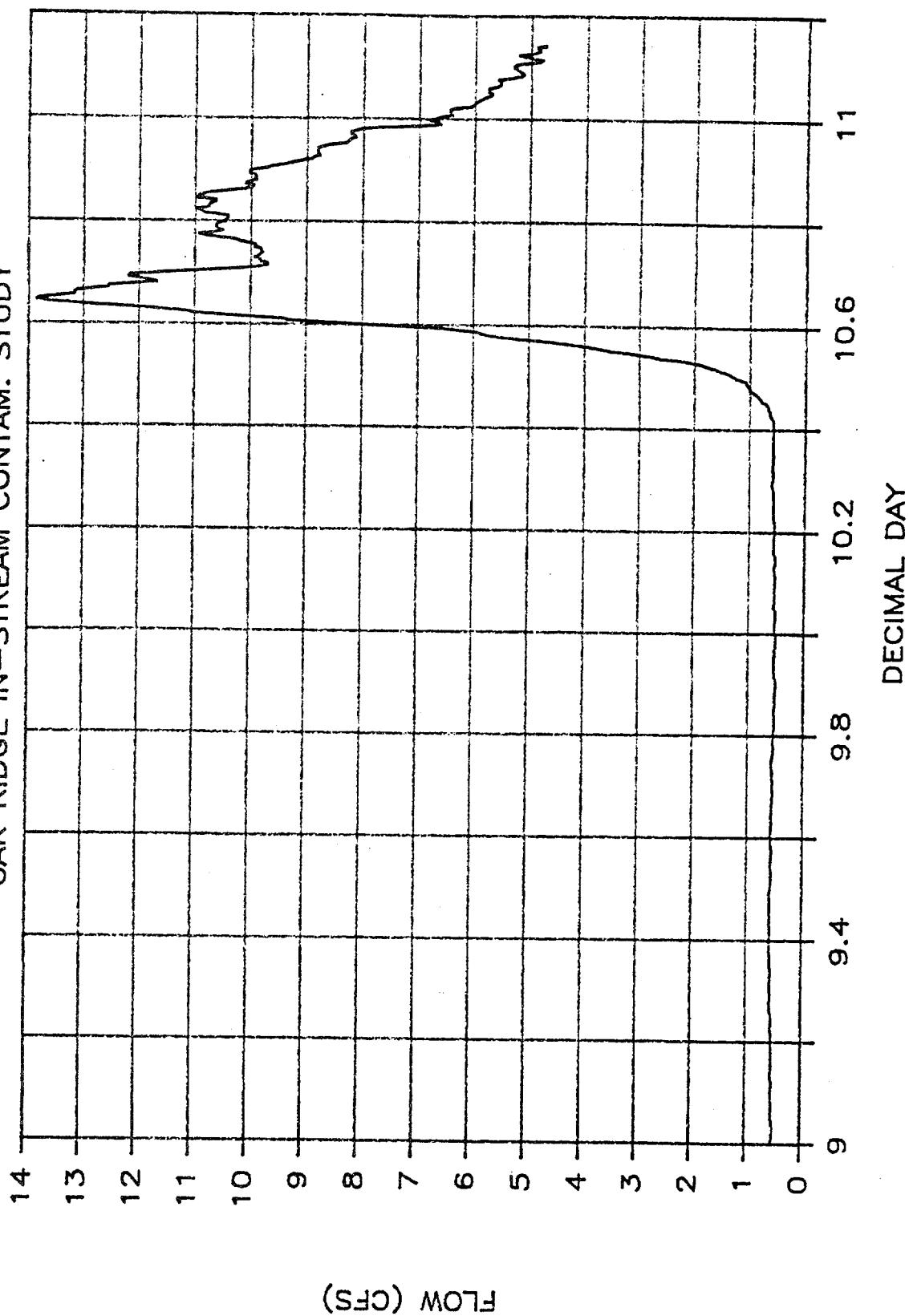


E. F.K. POPLAR CR. MI. 14.4 - NOV. 1984  
OAK RIDGE IN-STREAM CONTAM. STUDY

-69-



MILL BRANCH MI. 0.2 - NOV. 1984  
OAK RIDGE IN-STREAM CONTAM. STUDY



BEAR CREEK MI. 0.55 - NOV. 1984  
OAK RIDGE IN-STREAM CONTAM. STUDY

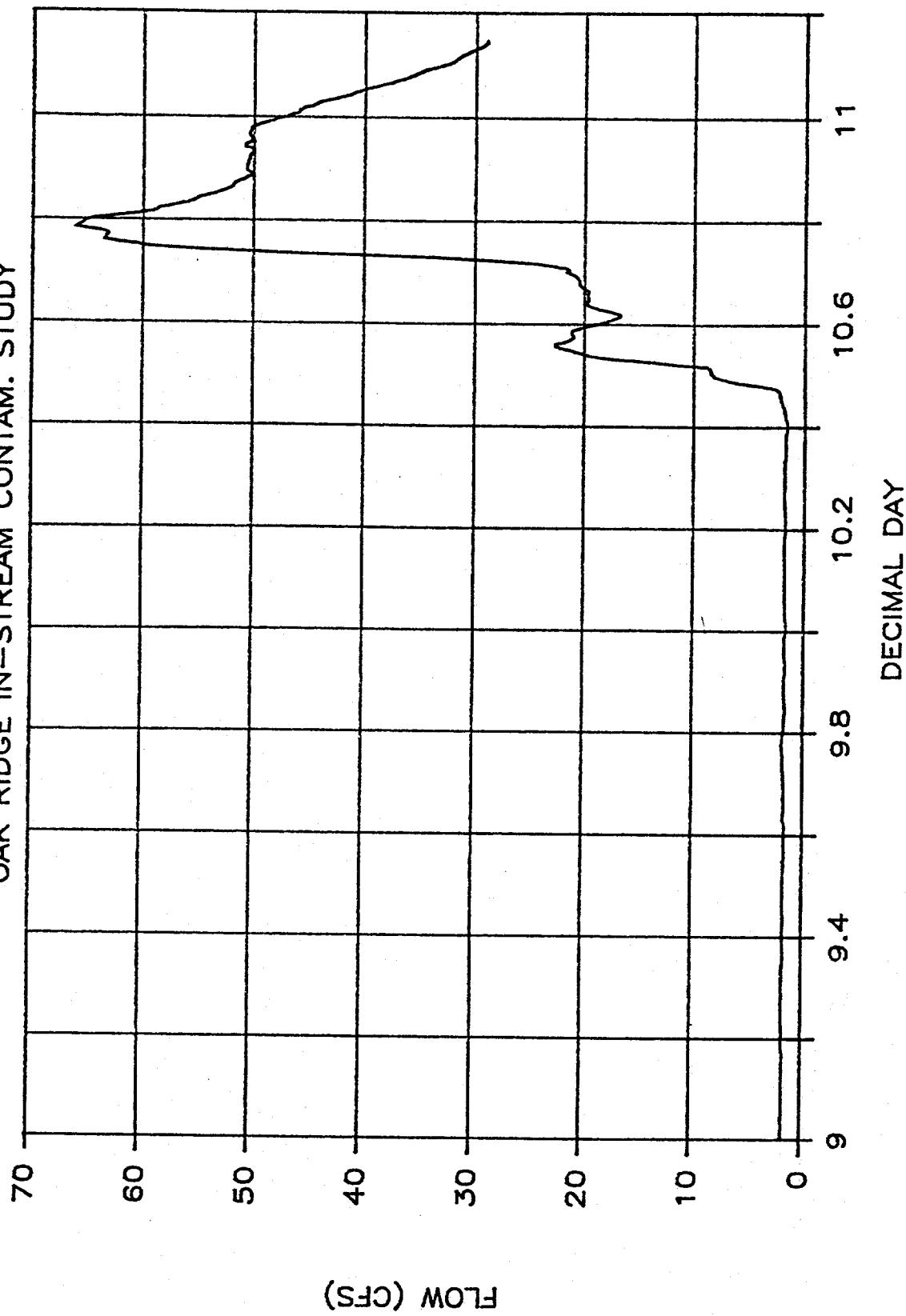
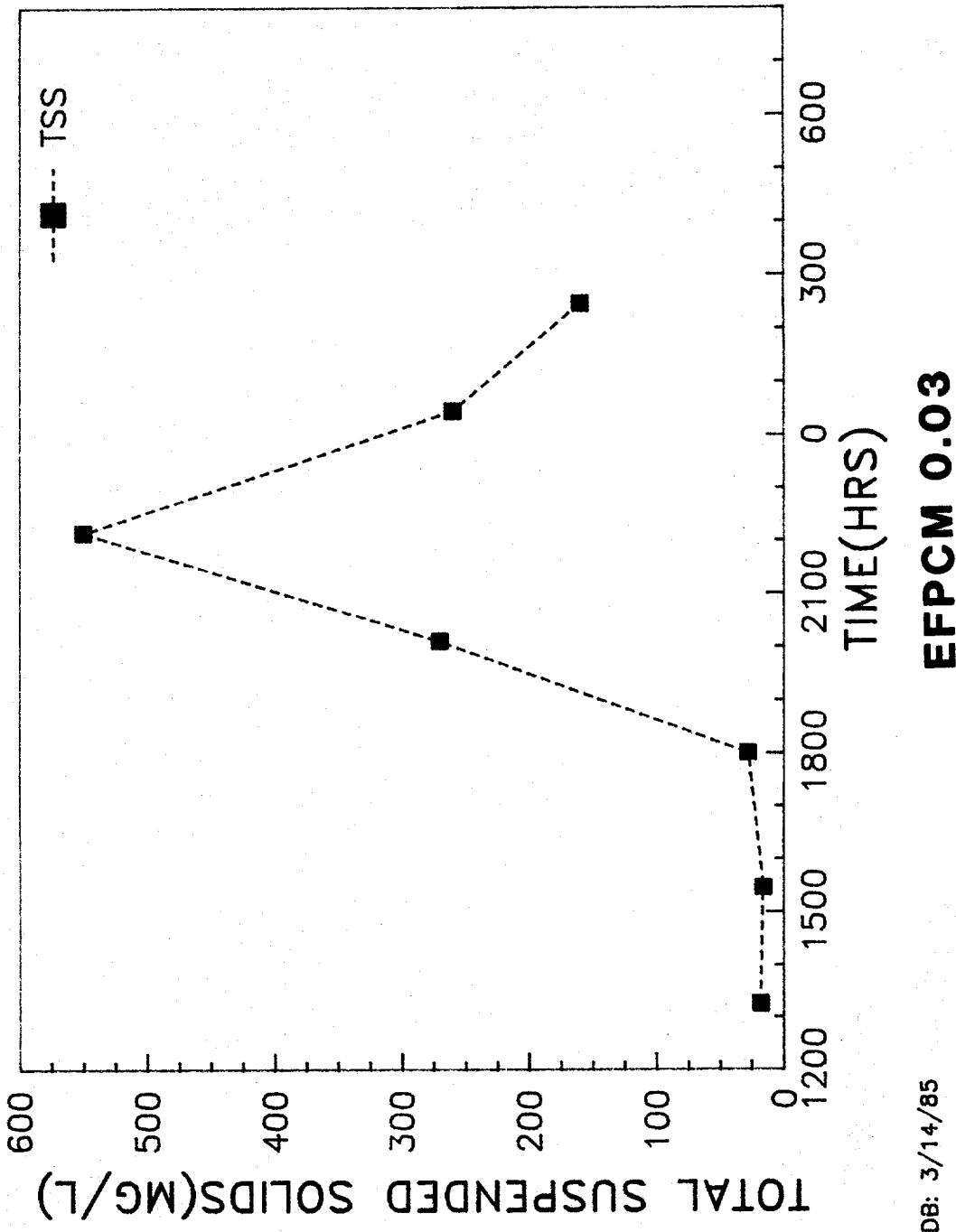


FIGURE 2

TOTAL SUSPENDED SOLIDS AND STREAMFLOW  
VERSUS TIME FOR DURATION OF SECOND STORM EVENT  
(NOVEMBER 10-11, 1984)

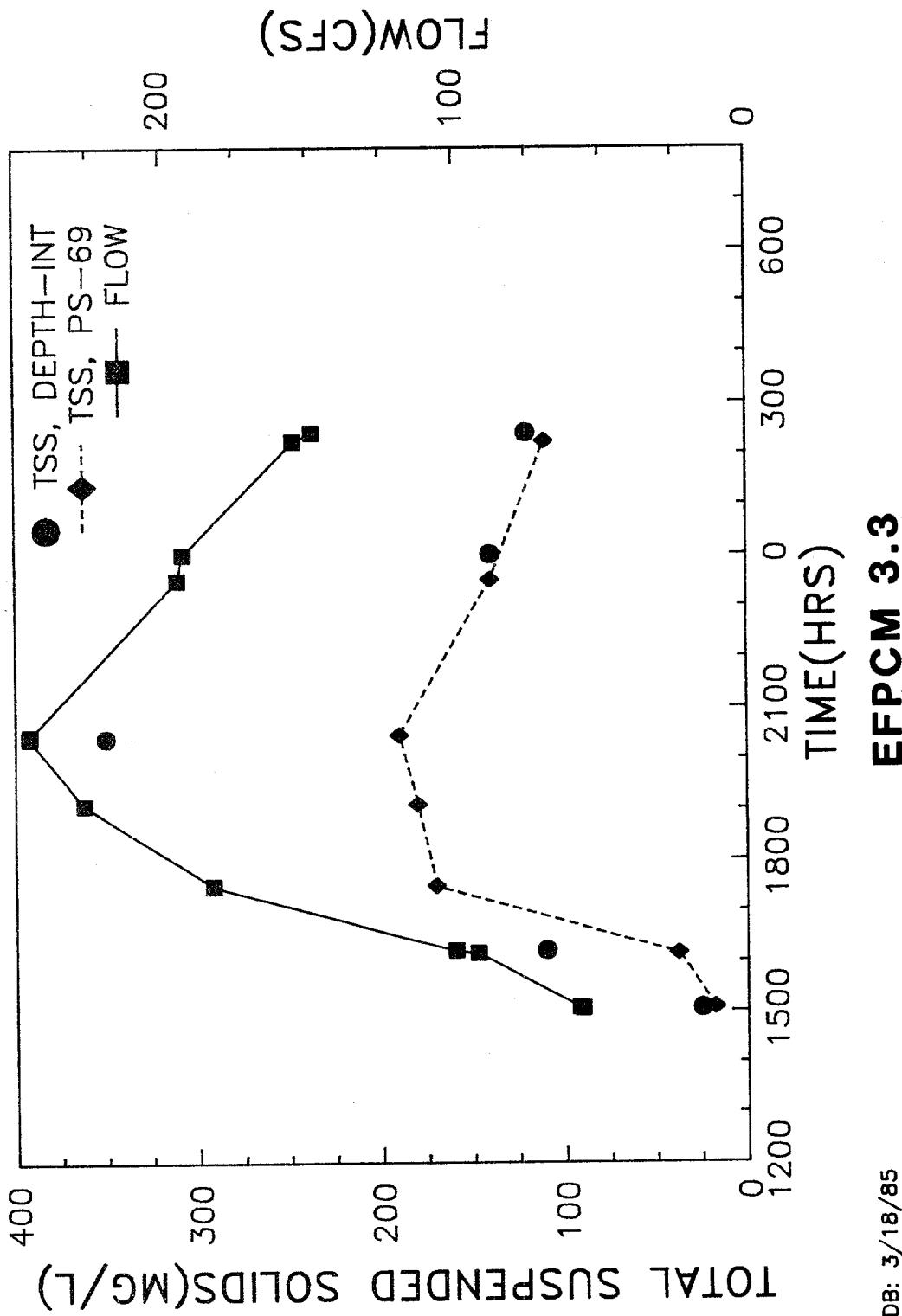
INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-73-



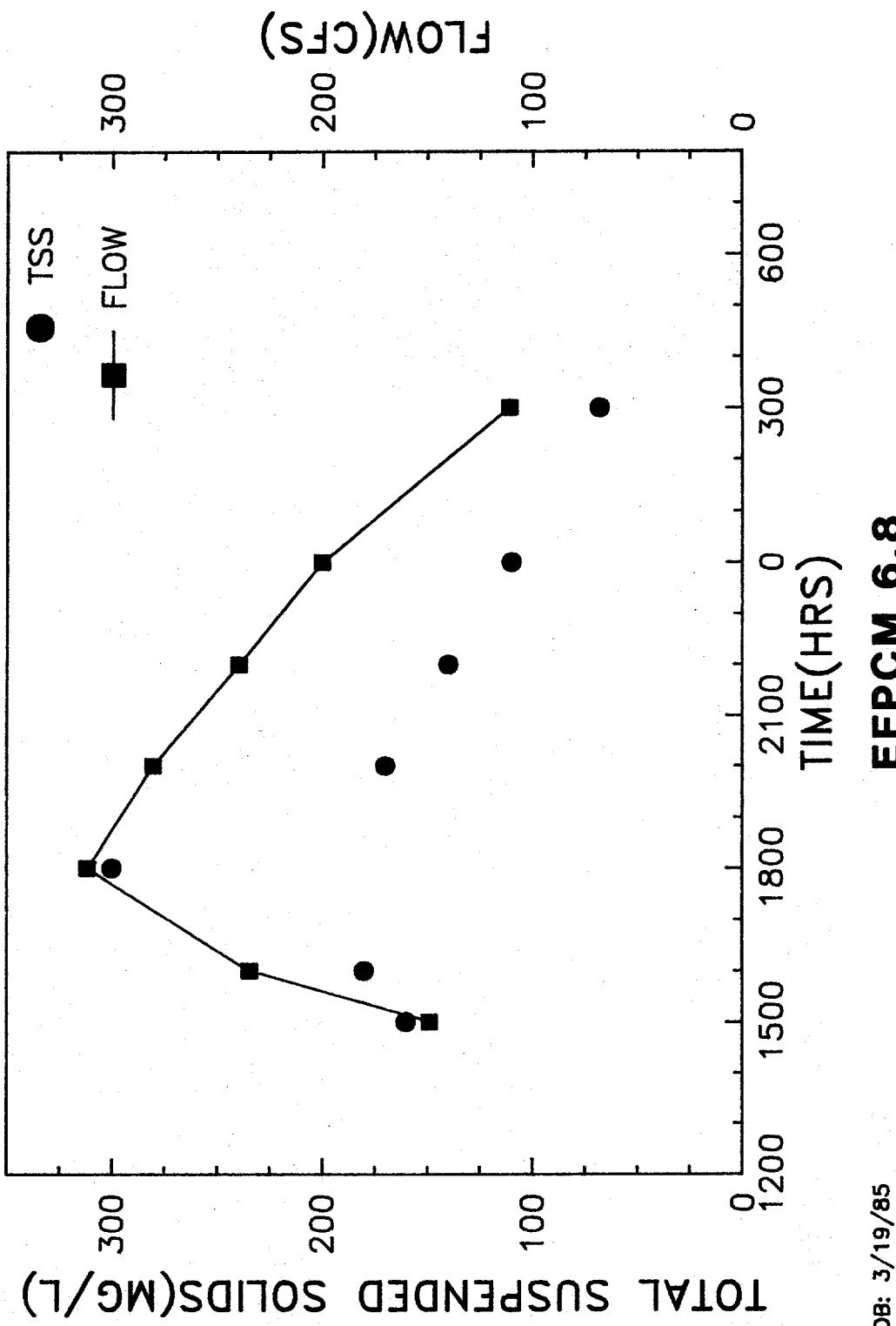
INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-74-



INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-75-

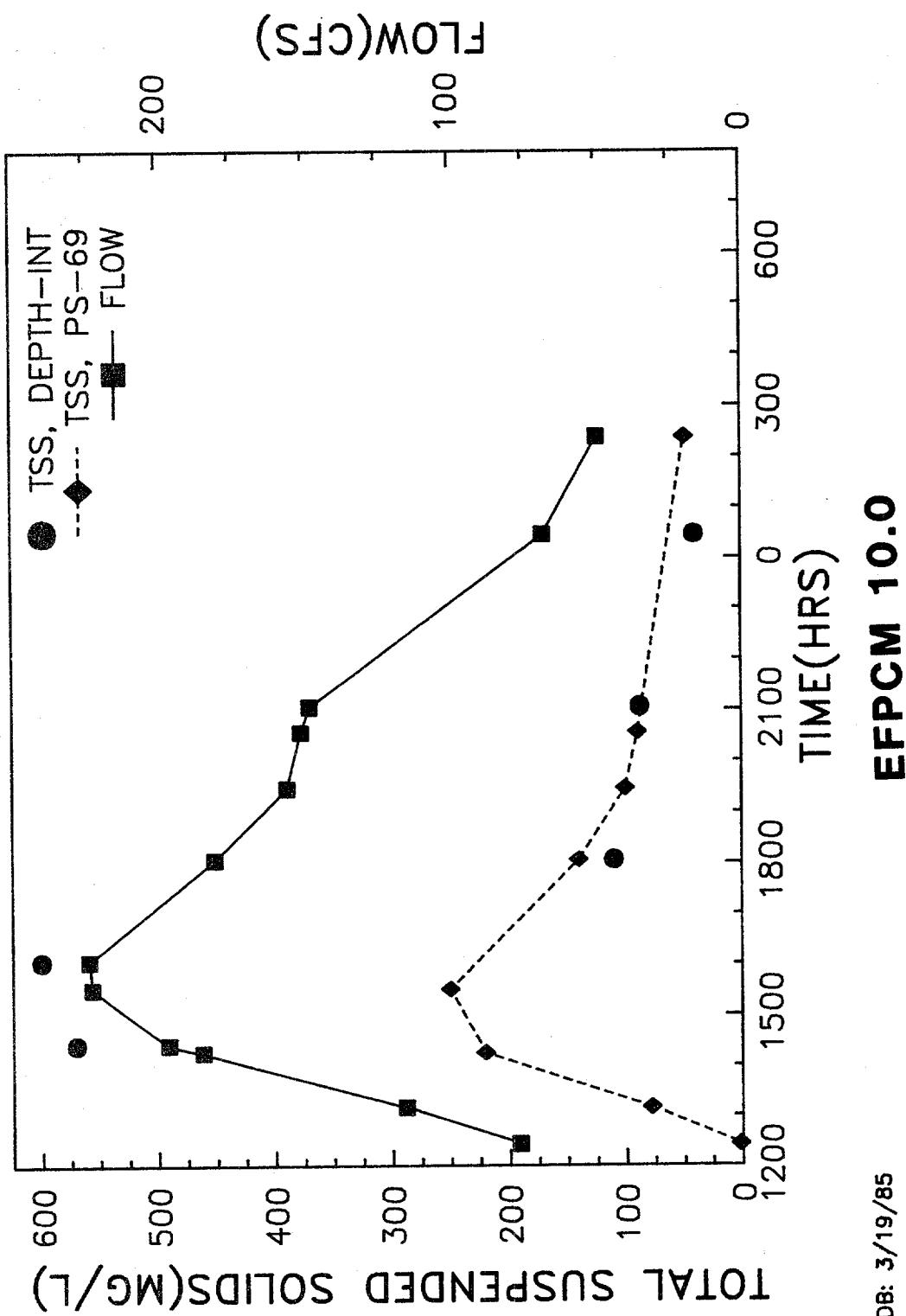


WSDB: 3/19/85

EFPCM 6.8

INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

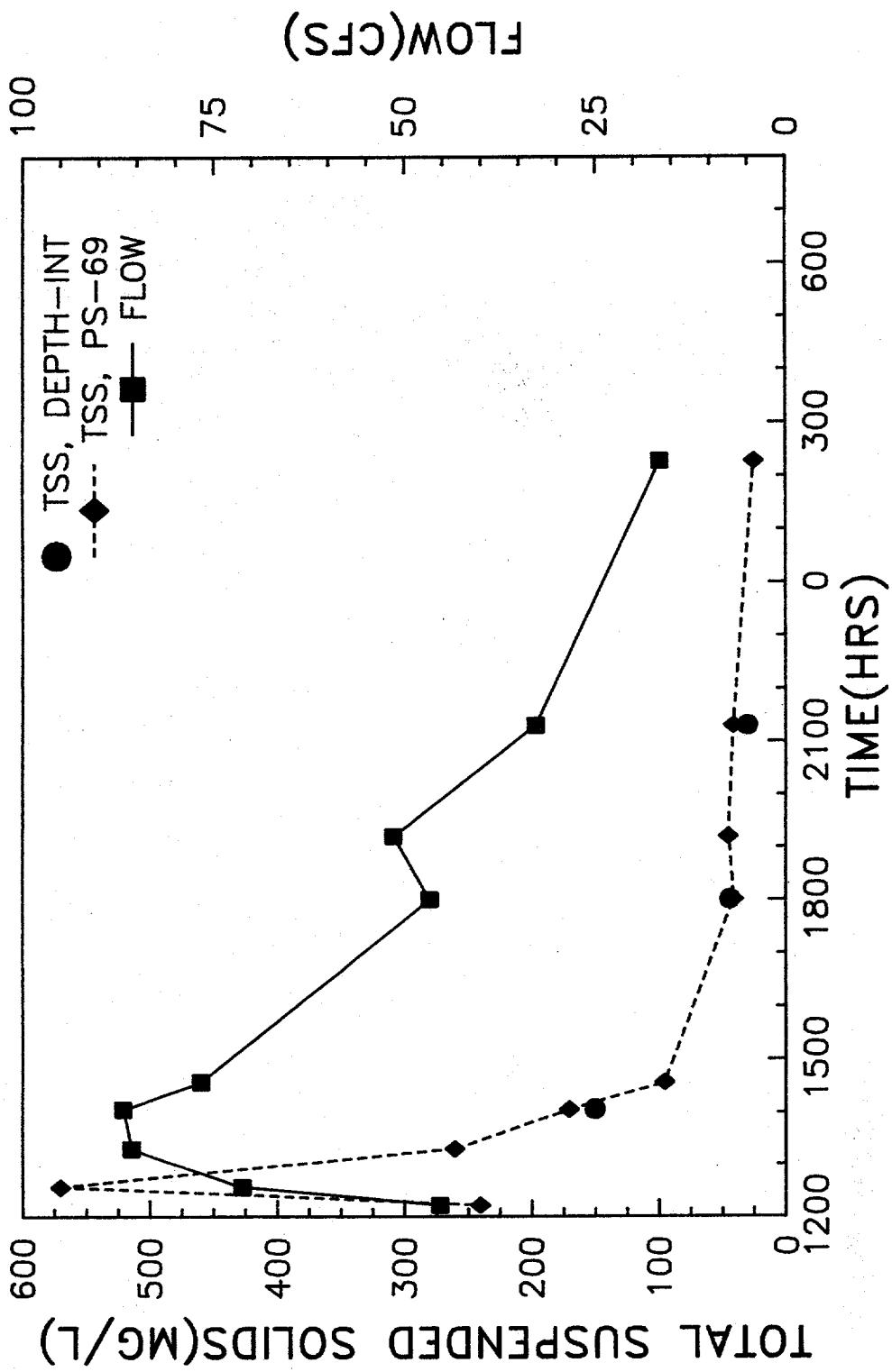
-76-



WSDB: 3/19/85

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-77-

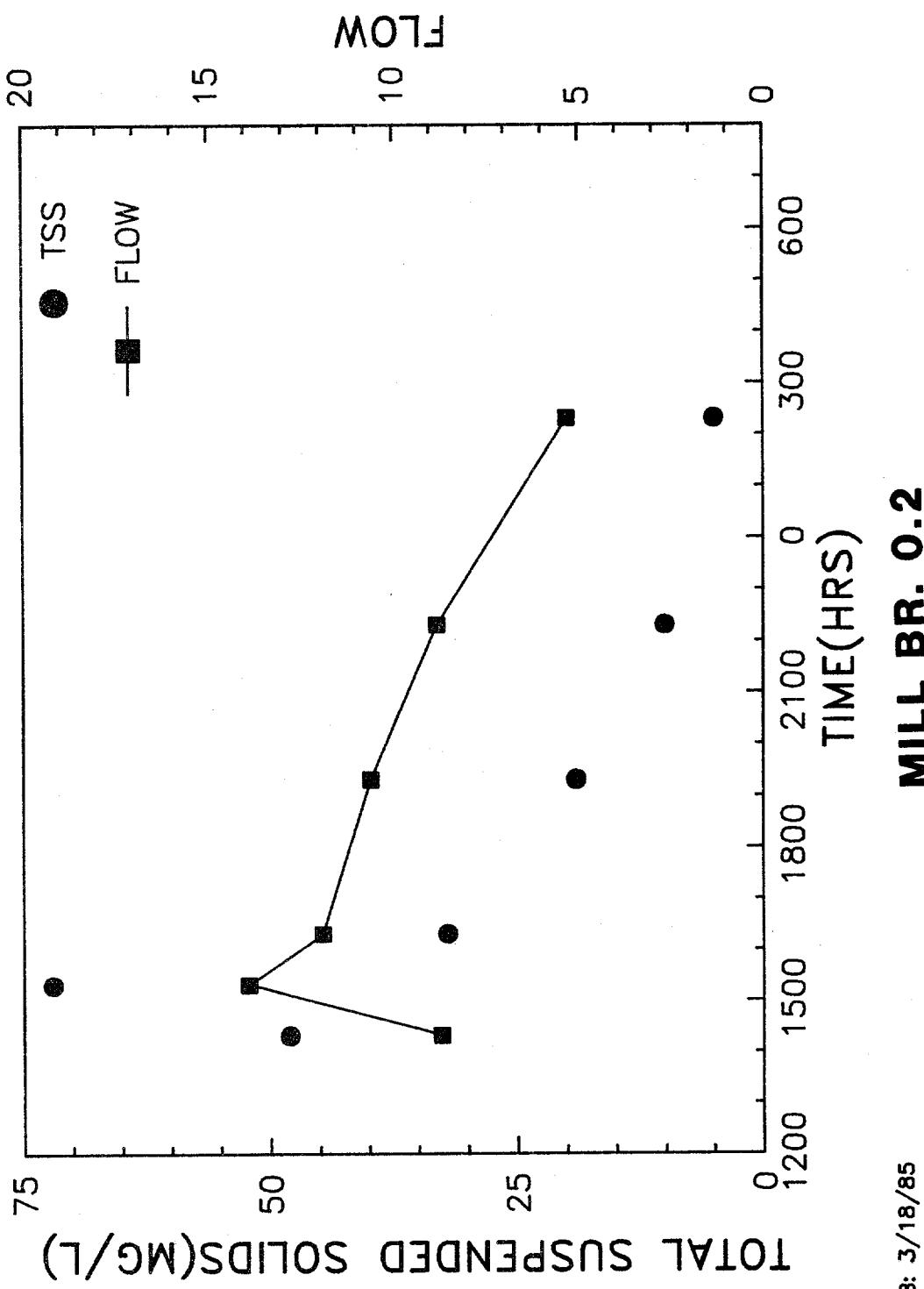


WSDB: 3/18/85

EFPCM 14.4

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-78-



INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-79-

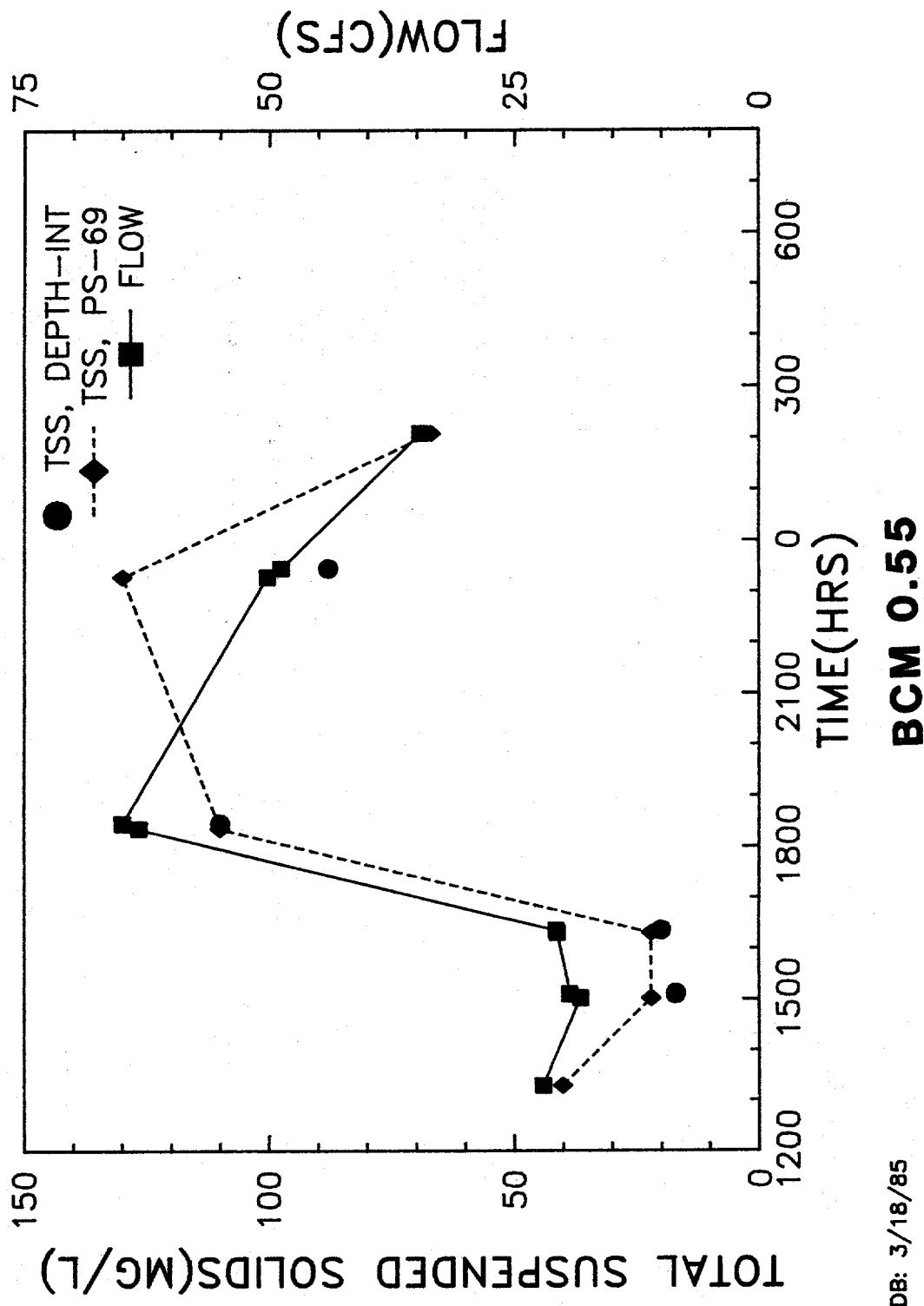
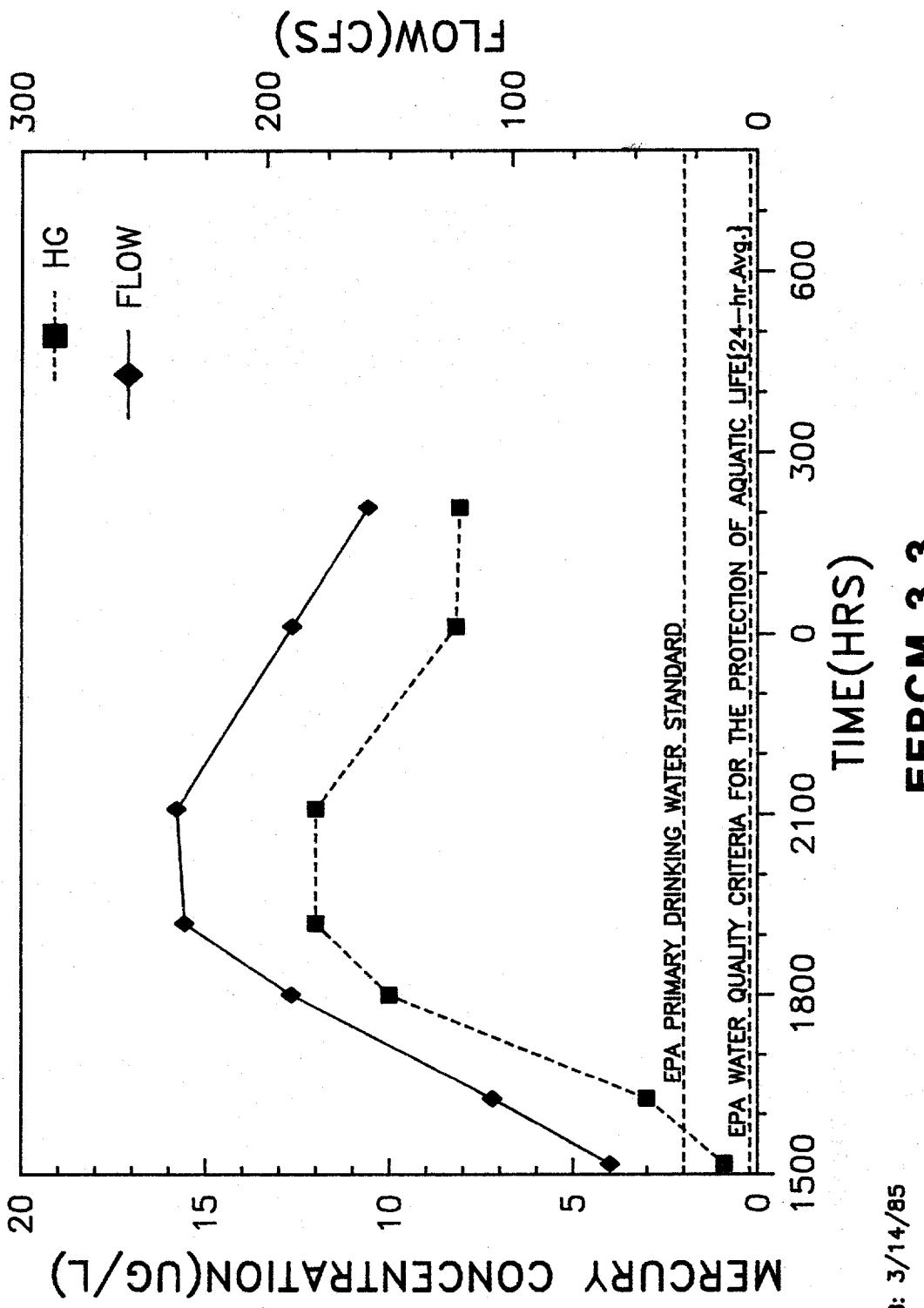


FIGURE 3

MERCURY AND STREAMFLOW VERSUS TIME  
FOR DURATION OF SECOND STORM EVENT  
(NOVEMBER 10-11, 1984)

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

-81-

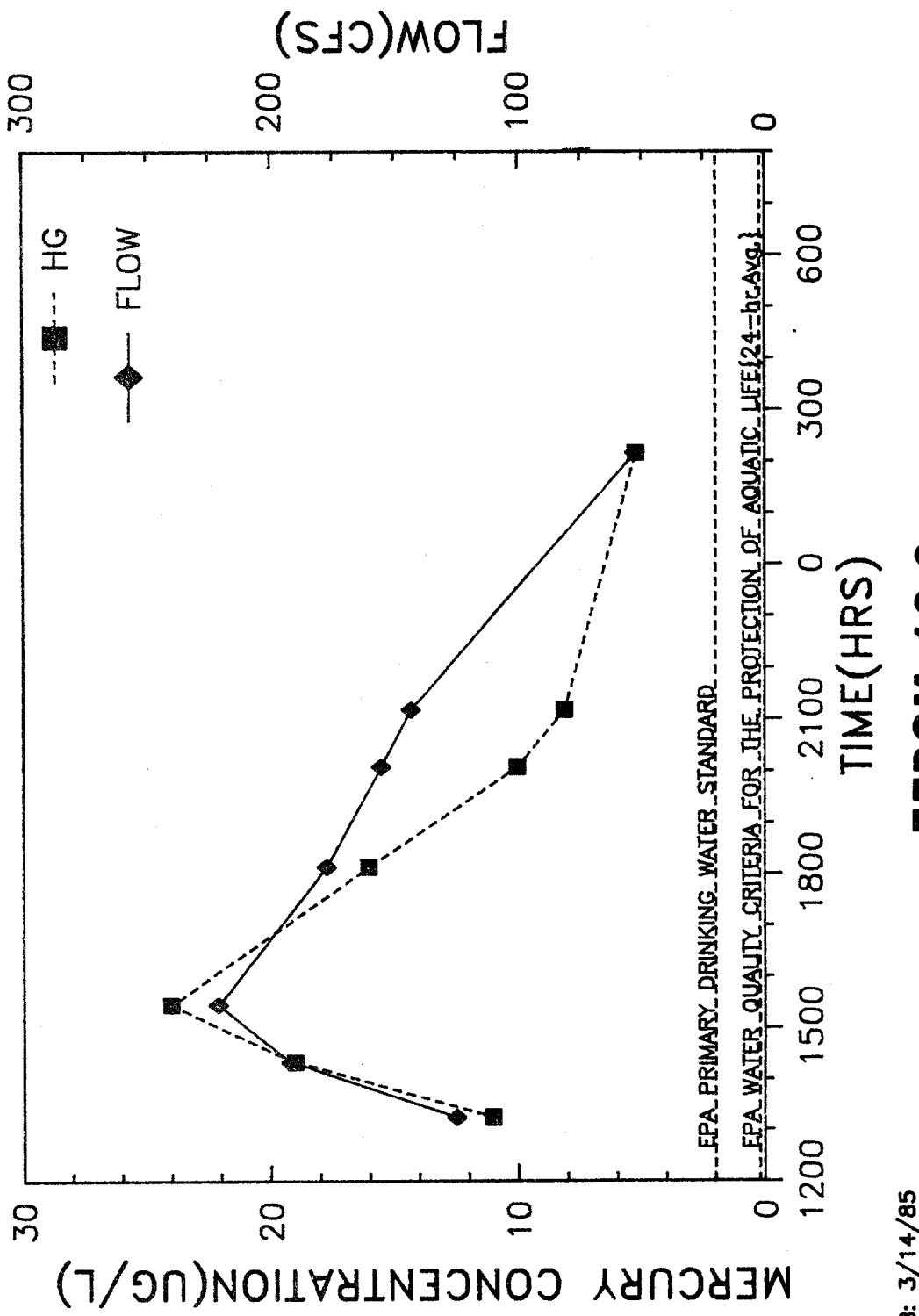


WSDB: 3/14/85

**EFPCM 3.3**

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

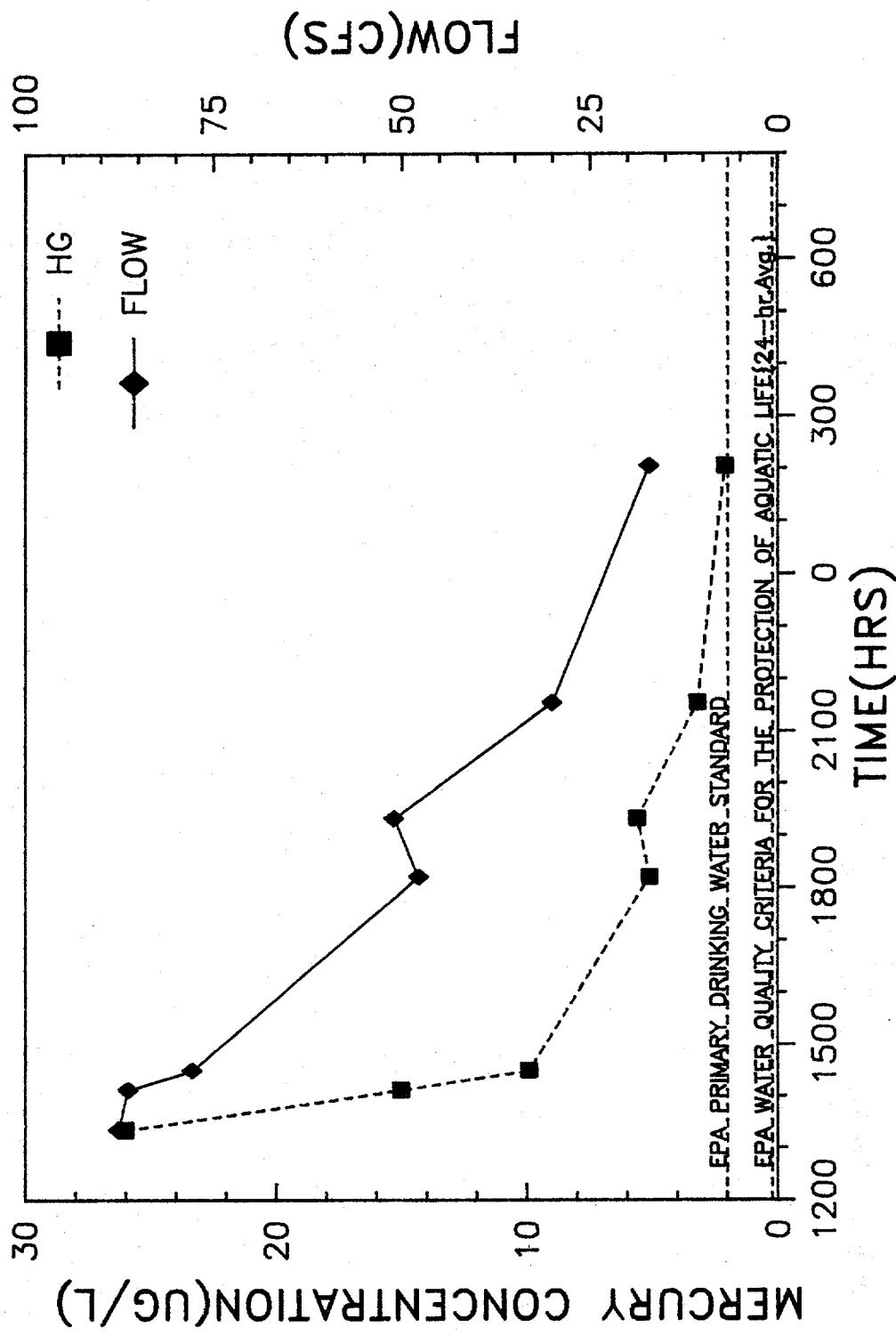
-82-



WSDB: 3/14/85

**EFP CM 10.0**

INSTREAM CONTAMINANT STUDY—TASK 1  
STORM FLOW SURVEY

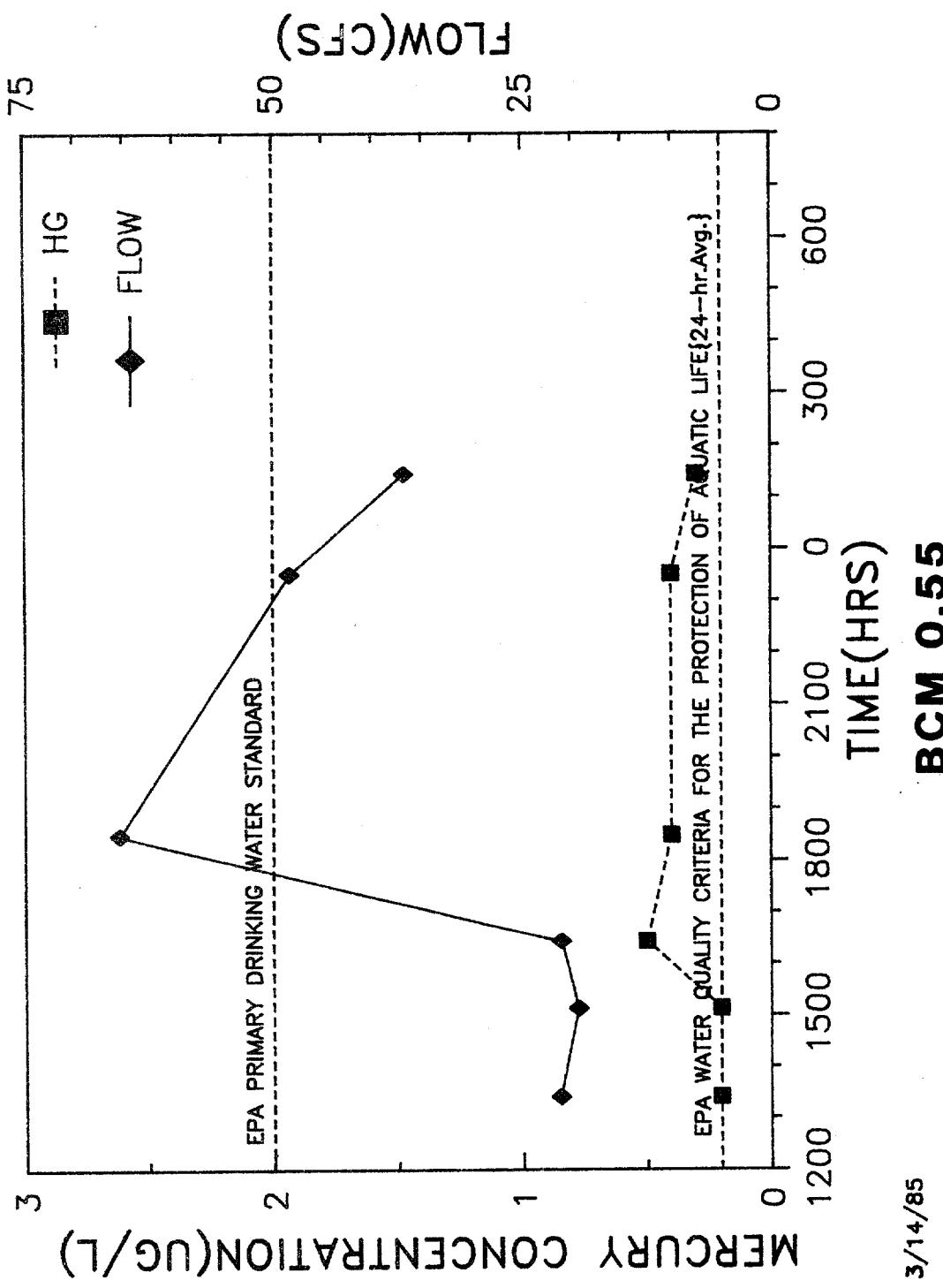


WSDB: 3/14/85

**EFP CM 14.4**

INSTREAM CONTAMINANT STUDY - TASK 1  
STORM FLOW SURVEY

-84-



WSDB: 3/14/85

**TABLE 1**  
**WATER AND BEDLOAD ANALYSES RESULTS - SECOND STORM**

STORED RETRIEVAL DATE: 95/11/4 10

476608  
 35 56 58.0 084 23 13.0 2  
 TRIBUTARY TO POPLAR CREEK 5.47  
 47145 TENNESSEE ROANE  
 CLINCH RIVER BASIN 040102  
 EAST FORK POPLAR CREEK 0.03  
 132TWAC 841103  
 0000 FEET DEPTH

STYPA/APPEND/STREAM

DATE	TIME	DEPTH	00008	84068	00002	HSAMPLOC	00063	00065	82079	00530	00535	71821	00010
FRCP	OF	LAB	SERIES	CCE	%	FRM	SAMPLING	NO. OF	STREAM	TURBIDTY	RESIDUE	SPECIFIC	WATER
TC	DAY	IDENT*	ALPHA	FT	FT	RANK	POINTS	STAGE	LAR	TOT NFLT	VOL NFLT	GRAVITY	TEMP
84/11/10	13	25											
	14	45	140	150		150		5	1.80				18
	15	45		160		160		5	1.65				
	17	10		170		170		5	2.27				16
	18	00		180		180		5	2.30				
	19	10		190		190		5	2.30				
	20	10		200		200		5	2.30				
	21	05		210		210		5	2.95				
	22	15		220		220		5	2.75				
	23	15		230		230		5	2.12				
	24	00		240		240		5	2.30				
	01	35		250		250		5	2.51				
	02	45		260		260		5	2.55				
84/11/10	13	25	CP(R)-6						2.56				
84/11/11	02	45											

84/11/10 13 25  
 CP(R)-6  
 84/11/11 02 45

DATE	TIME	DEPTH	71890	MERCURY	80203	TCT SED	80206	80208	80327	80325	80322	R0328
FRCP	OF	HC,DISS	HG, TOTAL	STEVE	TOT SED	TOT SED	TOT SED	TOT SED	SUS PART	SUS PART	SUS PART	SUS PART
TC	DAY	FEET	UG/L	%<.062%	STEVE	STEVE	STEVE	STEVE	> 63U	> 63U	> 63U	> 63U

DATE	TIME	DEPTH	80326	SLIS PART	01501	ALPHA-T	03502	22383	22384	17519	17520	21510
FRCP	OF	HC,DISS	>2000 UM	TOTAL	BETA	BETA	BETA	RI-214	RI-214	PB-214	PB-214	MPA-234
TC	DAY	FEET	MG/L	PC/L	ERRCR	ERRCR	ERRCR	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL

DATE	TIME	DEPTH	80326	SLIS PART	01501	ALPHA-T	03502	22383	22384	17519	17520	21510
FRCP	OF	HC,DISS	>2000 UM	TOTAL	BETA	BETA	BETA	RI-214	RI-214	PB-214	PB-214	MPA-234
TC	DAY	FEET	MG/L	PC/L	ERRCR	ERRCR	ERRCR	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL

84/11/10 13 25  
 CP(R)-6  
 84/11/11 02 45

0.11

STORED RETRIEVAL DATE 85/04/10

四百一〇

15 57 59.0 094 21 31.0 2  
USGS GAGING STATION - BRIDGE 2.3 M NNE OF WHEAT  
47145 TENNESSEE ROANE  
CLINCH RIVER BASIN 040102  
EAST FORK POPLAR CREEK 3.3

STORE1 RETRIEVAL DATE: 5/04/10

476510  
 35 57 58.0 084 21 31.0 2  
 USGS GAGING STATION - BRIDGE 2.3 M NNE OF WHEAT  
 ROANE  
 47145 TENNESSEE  
 CLINCH RIVER BASIN  
 FAST FORK POPLAR CREEK 3.3  
 132TVAC 840601

/TYPE/AMENT/STREAM

DATE	TIME	DEPTH	00008	84068	000C2	00063	00055	82079	00530	00535	71821	00010
FRCN	OF	LAB	SERIES	%SAMPLCC	% FRCM	NO. OF SAMPLING POINTS	STREAM STAGE FEET	TURBIDY LAB NTU	RESIDUE TOT NFLT MG/L	RESIDUE VOL NFLT MG/L	SPECIFIC GRAVITY	WATER TEMP CENT
TC	DAY	IDENT.	CCE	% RT BANK							SEDGM/GM	
84/11/12	02	40										
84/11/12	15	C5										
CP(B)-6												
84/11/12	02	40										

DATE	TIME	DEPTH	71890	71900	80203	80204	90205	80208	80327	80325	80322	80328
FRCN	OF	MERCURY	MERCURY	MERCURY	TCT SED	TOT SED	TOT SED	TOT SED	SUS PART	SUS PART	SUS PART	SUS PART
TC	DAY	HG,DISS	HG,TOTAL	HG,L	SIEVE	SIEVE	SIEVE	SIEVE	>63U	>125U	>125U	GT500UM MG/L
84/11/10	15	18	0.2U	0.9								
	16	27	0.2	3.0								
	18	00	0.9	10.0								
	19	19	0.2	12.0								
	21	69	0.2U	12.0								
20	00											
CP(B)-6												
84/11/10	21	30										
	21	50										
CP(B)-6												
84/11/10	23	00	0.2U	8.2								
	02	09	0.2U	8.1								
CP(B)-6												
84/11/12	02	40										

DATE	TIME	DEPTH	80326	80326	01501	01502	03501	03502	22383	17519	17520	21510
FRCN	OF	SUS PART	SUS PART	ALPHA	ALPHA-T	BETA	BETA-T	BETA-T	81-214	PB-214	PB-214	MPA-234
TC	DAY	>2000 UM	TOTAL	TOTAL	ERROR	TOTAL	ERROR	ERROR	TOTAL	TOTAL	TOTAL	TOTAL
84/11/10	20	40										
	15	C5										
CP(B)-6												
84/11/12	02	40										

DATE	TIME	DEPTH	80326	80326	01501	01502	03501	03502	22383	17519	17520	21510
FRCN	OF	SUS PART	SUS PART	ALPHA	ALPHA-T	BETA	BETA-T	BETA-T	81-214	PB-214	PB-214	MPA-234
TC	DAY	>2000 UM	TOTAL	TOTAL	ERROR	TOTAL	ERROR	ERROR	TOTAL	TOTAL	TOTAL	TOTAL
84/11/10	20	40										
	15	C5										
CP(B)-6												
84/11/12	02	40										

SECRET RETRIEVAL DATE 85/04/10

476509  
 35 58 56.0 084 19 39.0 2  
 ADJACENT TO OAK RIDGE COUNTRY CLUB  
 47145 TENNESSEE ROAN F  
 CLINCH RIVER BASIN 040102  
 EAST FORK POPLAR CREEK 6.80  
 132TVAC R40601  
 0000 FEET DEPTH CSN-RSP 0735370-0695327

STYFA/AMENT/STREAM

DATE	TIME	DEPTH	LAB	SERIES	PSAMPLOC	No. OF	00063	00065	82079	00530	00535	71R21	00010
FRCM		OF	IDENT.	CCE	* FRM	SAMPLING	STAGE	STREAM	TURBIDTY	RESIDUE	RESIDUE	SPECIFIC	WATER
TC		DAY	NUMBER	ALPHA	RT RANK	POINTS	FEET	NTU	LAH	TOT NFLT	VOL	GRAVITY	TEMP
84/11/10	14	20		1F									
	15	00		14D				5	2.10	54.0	120	18	
	15	15		2F					2.50	110.0	160		
	16	00		15D				5	2.85		200	26	
	17	05		16C					3.25				
	18	00		3F					3.50	200.0	400	80	
	18	01		17D				5	3.96		300		
	19	00		18D					3.46				
	20	00		19C					3.25		170		
	21	00		20D					3.05				
	22	00		21C					5				
	23	00		22D					2.95				
	24	00		23D					5	2.75			
	84/11/11	01	00	24D					5	2.60			
		02	00	25D					5	2.30			
		03	00	26D					5	2.05			
	84/11/10	15	00							5			
	CP(R)-6									1.75			
	84/11/11	03	00										

DATE	TIME	DEPTH	MERCURY	71890	80203	80204	80206	80208	80327	80325	80322	80328	
FRCM		OF	HGDISS	TCT SED	TOT SED	101 SED	TOT SED	TOT SED	SUS PART	SUS PART	SUS PART	SUS PART	
TC		DAY	UG/L	HG TOTAL	STEVE	SIEVE	SIEVE	SIEVE	>63U	>63U	>63U	>63U	
84/11/10	15	00		X<.062MM	X<.125MM	X<.500MM	X<.200MM	X<.00MM	LT6.35MM	LT6.35MM	LT6.35MM	LT6.35MM	
	CP(R)-6												
	84/11/11	03	00										

84/11/10 15 00  
 CP(R)-6  
 84/11/11 03 00

DATE	TIME	DEPTH	SUS PART	80326	01501	015C2	03501	22383	BI-214	PB-214	17519	21510
FRCM		OF	>2000 UM	>2000 UM	ALPHA	ALPHA-T	BETA	BI-214	TOTAL	TOTAL	TOTAL	MPA-234
TC		DAY	MG/L	MG/L	TOTAL	ERROR	TOTAL	PC1/L	PC1/L	PC1/L	PC1/L	TOTAL
84/11/10	15	00		0.1U								
	CP(R)-6											
	84/11/11	03	00									

STORE 1 RETRIEVAL DATE 95/04/10

476528  
35 59 55.0 084 18 00.6 1

BRIDGE AT WILSHIRE

47001 TENNESSEE

CLINCH RIVER BASIN

FAST FORK POPLAR CREEK 10.0

132TVAC 840601

00000 FEET DEPTH CSN-RSP 0735369-0695324

DATE	TIME	DEPTH	LAB	SERIES	PSAMPLOC	NO. OF	STREAM	TURBIDITY	RESIDUE	00010
FRCP	OF	FEET	IDENT.	CCE	X FRM	SAMPLING	STAGE	LAB	TOT NFLT	WATER
TC	DAY	FEET	NUMBER	ALPHA	RT RANK	POINTS	FEET	NTU	M6/L	TEMP
04/11/10	12	43		1A		1			3.4	71821
	13	17		7A		1			56.0	00010
	13	24		8A		1			78	11
	14	25		19A		1			190.0	220
	14	32		20A		1				26
	14	40		6D		5				
	15	44		32A		1			570	
	15	45		11B		20				
	15	49		33A		1				
	15	50	4029751R	2R		50				
	16	00		12B		40				
	16	05		7D		E				
	16	20		13B		50				
	16	35		14B		70				
	17	05		15B		90				
	15	45								

CP(B)-05

04/11/10	17	05								2.27
	17	20								
	17	25								
	17	50								
	18	04								
	18	05								
	18	06								
	18	12								
	18	20								
	17	35								
CP(B)-04										1.73
04/11/10	18	20								
	19	45								
	20	07								
	20	55								
	21	05								
	21	17								
	21	45								
	21	45								
	19	40								
CP(B)-6										

STORED RETRIEVAL DATE 95/04/10

476508  
35 59 55.0 044 18 00.6 1

BRIDGE AT WILTSIHR  
47001 TENNESSEE  
CLINCH RIVER BASIN  
EAST FORK POPLAR CREEK 10.0  
132TVAC 840601  
0000 FEET DEPTH

CSN-RSP 0735369-0695324

/TYPE/ AMENT/ STREAM

DATE	TIME	DEPTH	LAB	SERIES	FSAMPLOC	NO. OF	SAMPLING	00002	00063	82079	00539	00535	71821	00010
FRCM	OF	FROM		CCCE	X	FROM	POINTS		STREAM	TURBIDTY	RESIDUE	SPECIFIC	WATER	
TC	CAY	FEET		ALPHA	X	RT RANK			STAGE	LAR	VOL NFLT	GRAVITY	TEMP	
84/11/11	02	15						81A		1	MG/L	MG/L	SEDGM/GM	CENT
	02	37						82A		1				

8

26.0

1

48

8

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

STORED RETRIEVAL DATE 85/04/10

474507

35 59 43.3 084 14 27.3 1  
 4FLow NEW HOPE POND DIVERSICA POINT  
 ANDERSON  
 47001 TENNESSEE  
 CLINCH RIVER BASIN 040102  
 EAST FORK POPLAR CREEK 14.36  
 132TVAC 840601

## \*TYPE/AMENT/STREAM

DATE	TIME	DEPTH	LAB	SERIES	PSAMPLOC	00002	00053	00055	8207 <sup>a</sup>	00530	00535	71821	00010
FRCP	OF	FEET	IDENT.	CODE	A FRCM	NO. OF SAMPLING	STREAM STAGE	TURRIDY	RESIDUE	RESIDUE	SPECIFIC	WATER	
TC	DAY	FEET	NUMBER	ALPHA	R/T BANK	POINTS	FEET	LAB	TOT NFLT	VOL NFLT	GRAVITY	TEMP	
84/11/10	12	22			1A	1	1	1A	160.0	240	44	94	
	12	57			7A	1	1	7A	520.0	570	48	94	
	13	30			13A	1	1	13A	190.0	260			
	13	35			14A	1	1	14A					
	14	05			13C	2	2	13C					
	14	06			20A	1	1	20A					
	14	12			21A	1	1	21A					
	14	20	4089744R		2R	50	1	1.38	140.0	170		31	
	14	50			27A	1	1	27A					
	14	57			28A	1	1	28A					
	16	00			32A	1	1	32A					
	18	09			14C	3	3	14C					
	18	01			46A	1	1	46A					
	18	20			48A	1	1	48A					
	19	20			55A	1	1	55A					
	19	32			56A	1	1	56A					
	21	30			15D	3	3	15D					
	14	05											

6

84/11/10

21

30

DATE	TIME	DEPTH	MERCURY	71390	80203	80204	80206	80208	80327	80325	80328
FRCP	OF	HG	DIS	HG, TOTAL	TCT SED	TCT SED	TOT SED	TOT SED	SUS FART	SUS FART	SUS PART
TC	DAY	FEET	UG/L	UG/L	STIEVE	STIEVE	SIEVE	SIEVE	>63U	>125U	GT500UM
84/11/10	13	35		0.2U	26.0	15.0					
	14	12		0.2		0.2U					
	14	50		0.2U		9.9					
	18	20		0.4U		5.1					
	19	32		0.2U		5.5					
	14	05									

CP(R)-6

84/11/10 21 32

21 54

DATE	TIME	DEPTH	MERCURY	71390	80203	80204	80206	80208	80327	80325	80328
FRCP	OF	HG	DIS	HG, TOTAL	TCT SED	TCT SED	TOT SED	TOT SED	SUS FART	SUS FART	SUS PART
TC	DAY	FEET	UG/L	UG/L	STIEVE	STIEVE	SIEVE	SIEVE	>63U	>125U	GT500UM
84/11/11	02	04		0.2U	25	6					
	02	27									

0.2

2.1

DATE	TIME	DEPTH	MERCURY	71390	80203	80204	80206	80208	80327	80325	80328
FRCP	OF	HG	DIS	HG, TOTAL	TCT SED	TCT SED	TOT SED	TOT SED	SUS FART	SUS FART	SUS PART
TC	DAY	FEET	UG/L	UG/L	STIEVE	STIEVE	SIEVE	SIEVE	>63U	>125U	GT500UM
84/11/11	02	04		0.2U	25	6					
	02	27									

0.4

2.1

5.0

1.7

0.10

STORED RETRIEVAL DATE 05/04/10

476507

35 59 49.3 084 14 27.3 1  
BELOW NEW HOPE POND DIVERSION POINT  
47001 TENNESSEE ANDERSON  
CLINCH RIVER BASIN 040102  
EAST FORK POPLAR CREEK 14.36  
132TVAC 840601

STYPA/ABNT/STREAM

0000 FEET DEPTH CSN-RSP 0735368-0695321

DATE	TIME	DEPTH	SUS	PART	ALPHA	ALPHA-T	BETA	BETA-T	RI-214	PB-214	MPA-234	
FRCP	OF	MM	>2000	UM	TOTAL	ERROR	TOTAL	PC/L	TOTAL	TOTAL	TOTAL	
TC	DAY	FEET	MG/L	FC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	
84/11/10	14	20			15	4	03501	03502	22383	22384	17519	17520
	14	05					BETAT	BETAT	RI-214	PB-214		
							ERROR	ERROR	TOTAL	TOTAL		
							TOTAL	TOTAL	TOTAL	TOTAL		
							PC/L	PC/L	PC/L	PC/L		
							PC/L	PC/L	PC/L	PC/L		

84/11/10 14 20	15	4	37	5
CP(8)-6	14 05	0.1U		
84/11/10 21 30				

STORE1 RETRIEVAL DATE: 95/04/10

**#76512** 35 59 45.0 084 18 03-0 2  
TRIBUTARY TO EAST FORK POPLAR CREEK 9.66  
47-201 TENNESSEE ANFERSON  
CLINCH RIVER BASIN 040102

VOLUME A/APPENDIX B/ECON

		CSN-RSP		073537-3-0695333	
		DEPTH	FEET		
00008	84068	00002	00063	00065	00279
LAB	SERIES	HSAMPLC	NO. OF	STREAM	TURBIDTY
IDENT.	CODE	* FRCM	SAMPLNG	STAGE	RESIDUE
NUMBER	ALPHA	RI BANK	POINTS	FEET	LAR
				NTU	TOT NFLT
					ME/L
					MG/L
					SED/G/M
					GRAVITY
					SPECIFIC
					RESIDUE
					VOL. NFLT
					WATER
					TEMP
					CENT

	1F	14.0	14.0	5
84/11/10	12.00	10	10	
14.30	1.50	1.50	48	
15.30	1.60		72	
16.30	1.70		32	
17.30	1.80			
18.30	1.90			
19.30	2.00			
20.30	2.10			
21.30	2.20			
22.30	2.30			
23.30	2.40			
24.30	2.50			
25.30	2.60			
26.30	2.70			
27.30	2.80			
84/11/11	00.30			
01.30				
02.30				

0-79  
18  
E

DATE	TIME	DEPTH	MERCURY	TCT SED	TOT SED	SUS PART	SUS PART
FRCP	OF	FEET	HE/DISS	STEVE	STEVE	X	X
71890	71900	80203	80204	80206	80208	80327	80328
			MERCURY HG, TOTAL	TCT SED STEVE	TOT SED STEVE	SUS PART >63U	SUS PART >125U
			HG/	HG/	MM	MM	MM
				**0.62MM	**1.25MM	**2.00MM	**3.5MM

0.1U  
84/11/10 14:30  
CP(H)-G  
20111111 02:30

STORET RETRIEVAL DATE 25/04/10

476515  
 35 56 47.4 084 22 01.2 1  
 UPSTREAM FROM THE INFLUENCE OF EFPC BACKWATER  
 47145 TENNESSEE ROANE  
 CLINCH RIVER BASIN 040102  
 BEAR CREEK 0.55  
 132TVAC 840601  
 0000 FEET DEPTH

**STYFA/APENT/STREAM**

DATE	TIME	DEPTH	LAB	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER
FRCT	'F	'F	INFNT.	FRCP	STAGE	LAR	TOT NFLT	GRAVITY	TEMP
TC	CAY	FEET	NUMBER	RT RANK	FOINTS	NTU	MG/L	SEDM/GM	CENT
84/11/10	13	29		4A	1			40.0	40
	13	40		5A	1			26.0	22
	15	62		12A	1			1.05	17
	15	10		4D	1				
	15	12		13A	1				
	15	30	4089777R	2R	50	1	1.05	24.0	22
	16	30		20A	1			20	5
	16	35		50	1				
	16	42		21A	1				
	16	45		6D	1				
	18	35		31A	1				
	18	47		32A	1				
	21	00	4089785R	3R	50	1	1.05	120.0	17
	23	28		49A	1				
	23	45		70	1				
	15	10			5			50	
CP(B)-6	84/11/10	23	45						
		23	50	50A	1				
	84/11/11	01	43	55A	1				
		02	08	56A	1				

DATE	TIME	DEPTH	LAB	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER
FRCT	'F	'F	INFNT.	FRCP	STAGE	LAR	TOT NFLT	GRAVITY	TEMP
TC	CAY	FEET	NUMBER	RT RANK	FOINTS	NTU	MG/L	SEDM/GM	CENT
84/06/08				0000C2	00063	82079	00530	00535	71821
				H SAMPLC	NO. OF				00010
				CCCE	SAMPLING				
				ALPHA	RT RANK				
					FEET				

DATE	TIME	DEPTH	LAB	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER
FRCT	'F	'F	INFNT.	FRCP	STAGE	LAR	TOT NFLT	GRAVITY	TEMP
TC	CAY	FEET	NUMBER	RT RANK	FOINTS	NTU	MG/L	SEDM/GM	CENT
84/11/10	13	29		4A	1			40.0	40
	13	40		5A	1			26.0	22
	15	62		12A	1			1.05	17
	15	10		4D	1				
	15	12		13A	1				
	15	30	4089777R	2R	50	1	1.05	24.0	22
	16	30		20A	1			20	5
	16	35		50	1				
	16	42		21A	1				
	16	45		6D	1				
	18	35		31A	1				
	18	47		32A	1				
	21	00	4089785R	3R	50	1	1.05	120.0	17
	23	28		49A	1				
	23	45		70	1				
	15	10			5			50	
CP(B)-6	84/11/10	23	45						
		23	50	50A	1				
	84/11/11	01	43	55A	1				
		02	08	56A	1				

-95-

DATE	TIME	DEPTH	LAB	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER
FRCT	'F	'F	INFNT.	FRCP	STAGE	LAR	TOT NFLT	GRAVITY	TEMP
TC	CAY	FEET	NUMBER	RT RANK	FOINTS	NTU	MG/L	SEDM/GM	CENT
84/11/10	13	40		0.2U	0.2				
	15	12		0.2U	0.2				
	16	42		0.2U	0.5				
	18	47		0.2U	0.4U				
	15	10			5				
CP(B)-6	84/11/10	23	45						
		23	50	0.2U	0.4				
	84/11/11	01	43	0.2U	0.3				

DATE	TIME	DEPTH	LAB	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER
FRCT	'F	'F	INFNT.	FRCP	STAGE	LAR	TOT NFLT	GRAVITY	TEMP
TC	CAY	FEET	NUMBER	RT RANK	FOINTS	NTU	MG/L	SEDM/GM	CENT
84/11/10	13	40		0.2U	0.2				
	15	12		0.2U	0.2				
	16	42		0.2U	0.5				
	18	47		0.2U	0.4U				
	15	10			5				
CP(B)-6	84/11/10	23	45						
		23	50	0.2U	0.4				
	84/11/11	01	43	0.2U	0.3				

DATE	TIME	DEPTH	LAB	NO. OF	STREAM	TURBIDITY	RESIDUE	SPECIFIC	WATER
FRCT	'F	'F	INFNT.	FRCP	STAGE	LAR	TOT NFLT	GRAVITY	TEMP
TC	CAY	FEET	NUMBER	RT RANK	FOINTS	NTU	MG/L	SEDM/GM	CENT
84/11/10	13	40		0.2U	0.2				
	15	12		0.2U	0.2				
	16	42		0.2U	0.5				
	18	47		0.2U	0.4U				
	15	10			5				
CP(B)-6	84/11/10	23	45						
		23	50	0.2U	0.4				
	84/11/11	01	43	0.2U	0.3				

7.4 2.2 0.2

0.2

STORED RETRIEVAL DATE 35/04/10

476515  
35 56 49.4 084 22 01.2 1  
UPSTREAM FROM THE INFLUENCE OF EFPC BACKWATER  
47145 TENNESSEE  
ROAD  
CLINCH RIVER BASIN  
REAR CREEK 0.55

132TVAC 840601 CSN-RSP 0735375-0695338  
0000 FEET DEPTH

DATE	TIME	DEPTH	SUS PART	01501	01502	03501	03502	22384	17519	17520	21510
FRCD	OF	DAY	FEET	ALPHA	ALPHA-T	BETA	BETA-T	HI-214	PR-214	PB-214	MPA-234
TC			MET	TOTAL	ERROR	TOTAL	ERROR	TOTAL	TOTAL	TOTAL	TOTAL
			PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L	PC/L
84/11/10	15	30		5	2	16	3				
	21	00		15	4	55	7				
	15	10									

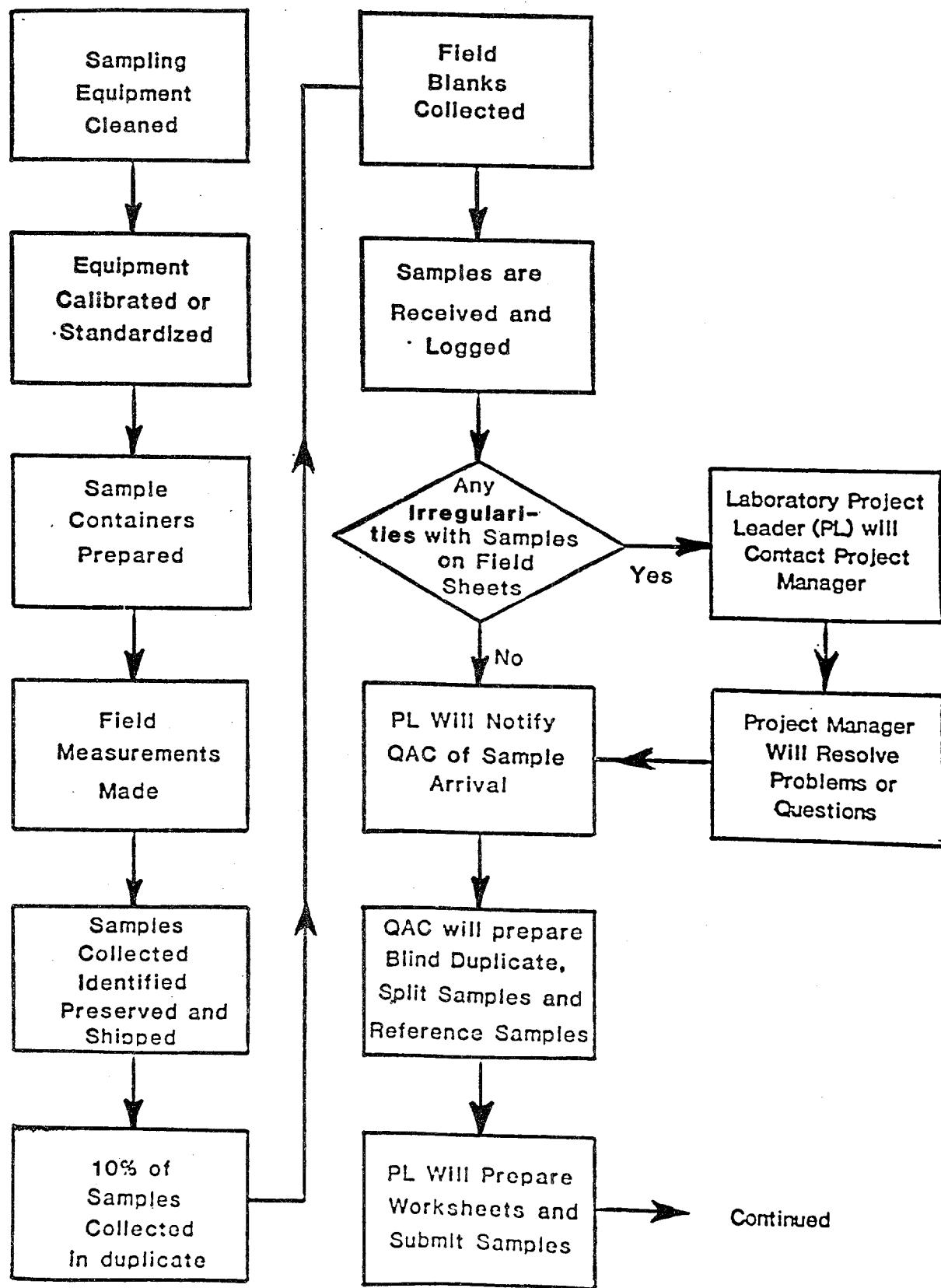
CP(B)-G 0.1U  
84/11/10 23 45

**APPENDIX IV**

**INSTREAM CONTAMINANT - TASK 1**

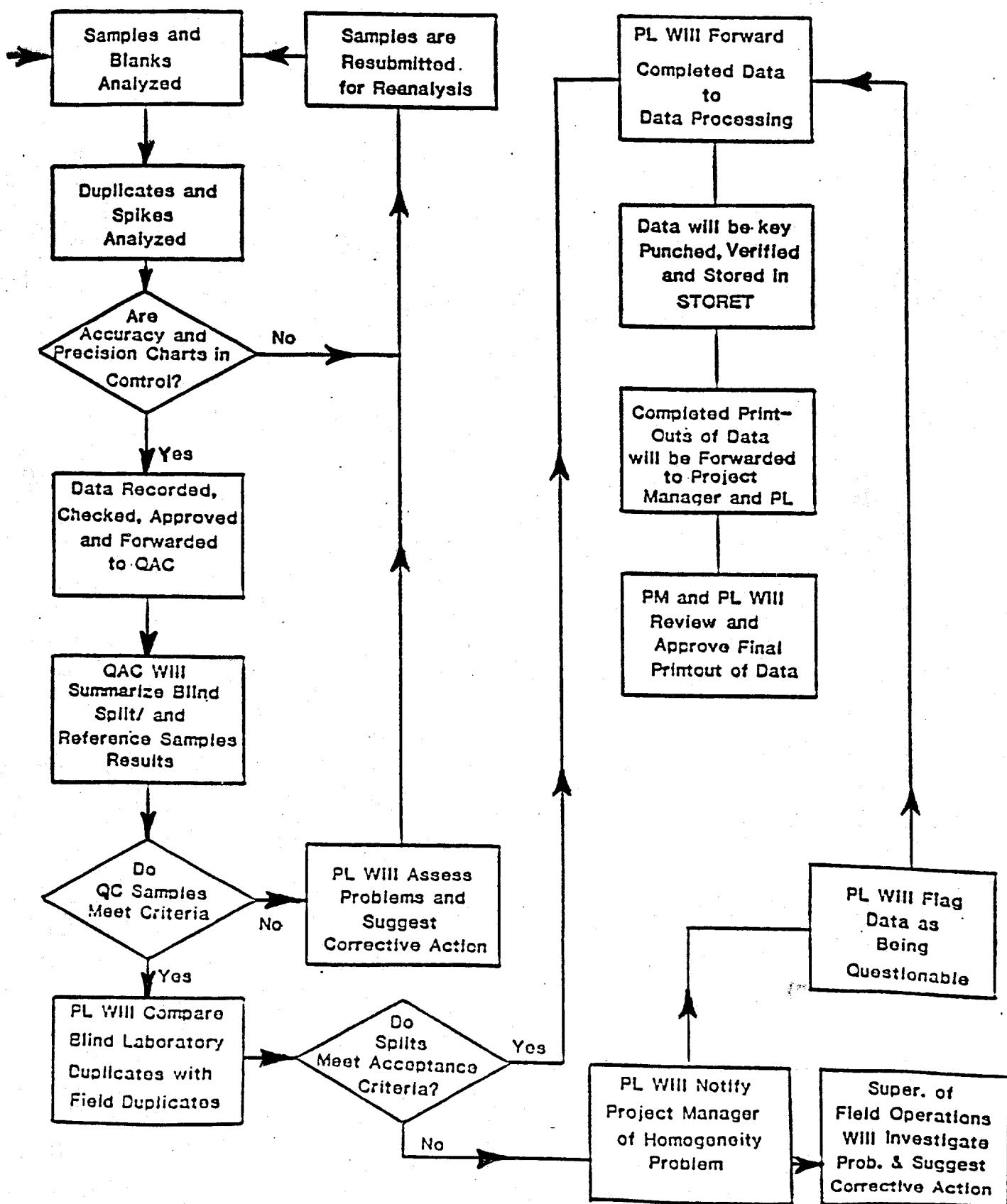
**QUALITY CONTROL**

FIGURE 1  
Sample Collection, Shipping and Receiving



## **FIGURE 2**

### Laboratory Analysis and Data Reporting



APPENDIX IV  
LABORATORY ANALYSIS PROCEDURES

1.0 Analytical Methodology

1.1 Routine Parameters

1.1.1 Applicable Documents

1.1.1.1 Methods for Chemical Analysis of Water and Wastes, Environmental Protection Agency, Office of Research and Development, Cincinnati, Ohio, 1979.

1.1.1.2 Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA 600/4-82-057, Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio, July 1982.

1.1.1.3 Methods for Determination of Inorganic Substances in Water and Fluvial Sediments, Book 5. Chapter A1, U.S. Geological Survey, Washington, DC, 1979.

1.1.1.4 "Standard Methods for the Examination of Water and Waste Water," APHA, AWWA, WPCF, American Public Health Association, Washington, D.C., 1971.

1.1.1.5 "Handbook of Radiochemical Analytical Methods," F. B. Johns, Editor, EPA 680/4-75-001, February 1975.

1.1.1.6 "Gross Alpha and Gross Beta Activity Determination," Procedure Number G-01, Laboratory Services, Tennessee Valley Authority, Muscle Shoals, Alabama, July 1984.

1.1.1.7 "Tritium Activity Determination in Urine, Atmospheric Moisture and Environmental Aqueous Samples," Procedure Number T-01, Laboratory Services, Tennessee Valley Authority, Muscle Shoals, Alabama, July 1984.

1.1.1.8 "Gamma Analysis of Environmental Samples," Procedure Number G-03, Laboratory Services, Tennessee Valley Authority, Muscle Shoals, Alabama, November 1980.

1.1.1.9 "Germanium Spectroscopy System Operating Procedure," Procedure Number OP-05, Laboratory Services, Tennessee Valley Authority, Muscle Shoals, Alabama, June 1984.

1.1.2 Summary of Methods

<u>Parameter</u>	<u>Applicable Documents</u>	<u>Type of Analysis</u>	<u>Detection Limit</u>
Residue, Nonfilterable	1.1.1.1 Method 160.2	Gravimetric	1 mg/L
Residue, Volatile	1.1.1.1 Method 160.4	Gravimetric	1 mg/L
Mercury, Total and Dissolved	1.1.1.1 Method 245.1	Manual Cold Vapor	0.2 µg/L
Turbidity	1.1.1.1 Method 180.1	Nephelometric	0.1 NTU
Hardness, Total	1.1.1.1 Method 130.2	EDTA Titrimetric	1 mg/L as CaCO <sub>3</sub>
Total Kjelkdaal Nitrogen	1.1.1.1 Method 351.2	Colorimetric, Semi-Automated Block Digestor	0.02 mg/L
Total Phosphorous	1.1.1.1 Method 365.4	Colorimetric, Semi-Automated Block Digestor	0.01 mg/L
Nitrate plus Nitrite Nitrogen	1.1.1.1 Method 353.2	Colorimetric, Automated Cadmium/reduction	0.01 mg/L
Oil and Grease	1.1.1.1 Method 413.1	Colorimetric	5 mg/L
Cyanide, Total	1.1.1.1 Method 335.2	Colorimetric	20 µg/L
Phenol, total	1.1.1.1 Method 420.1	Colorimetric, Manual with distillation	2 µg/L
Extractable Organics	1.1.1.2 Method 625	GC/MS, Methylene Chloride Extraction	Various Detection Limits
Volatile Organics	1.1.1.2 Method 624	GC/MS, Purge and Trap	Various Detection Limits
Pesticides and PCB's	1.1.1.2 Method 608	GC/EC, Methylene Chloride Extraction	Various Detection Limits
Arsenic	1.1.1.1 Method 206.2	AA - Furnace	1 µg/L
Antimony	1.1.1.1 Method 204.2	AA - Furnace	1 µg/L
Chromium	1.1.1.1 Method 218.2	AA - Furnace	1 µg/L
Copper	1.1.1.1 Method 200.7	ICP	5 µg/L
Zinc	1.1.1.1 Method 200.7	ICP	5 µg/L

<u>Parameter</u>	<u>Applicable Documents</u>	<u>Type of Analysis</u>	<u>Detection Limit</u>
Beryllium	1.1.1.1 Method 200.7	ICP	1 µg/L
Aluminum	1.1.1.1 Method 200.7	ICP	1 µg/L
Thallium	1.1.1.1 Method 200.7	ICP	50 µg/L
Nickel	1.1.1.1 Method 249.2	AA - Furnace	1 µg/L
Cadmium	1.1.1.1 Method 213.2	AA - Furnace	0.1 µg/L
Lead	1.1.1.1 Method 239.2	AA - Furnace	1 µg/L
Selenium	1.1.1.1 Method 270.2	AA - Furnace	1 µg/L
Silver	1.1.1.1 Method 272.2	AA - Furnace	10 µg/L
Lithium	1.1.1.3 Method 1-3425-78	AA - Direct	10 µg/L
Gross Alpha	1.1.1.4; 1.1.1.6	Alpha Counting	2.0 pCi/L
Gross Beta	1.1.1.4; 1.1.1.6	Beta Counting	2.4 pCi/L
Tritium	1.1.1.5; 1.1.1.7	Liquid Scintillation Counting	330 pCi/L
Gamma-Emitting Radionuclides	1.1.1.8; 1.1.1.9	Gamma Spectral Analysis of Ge(Li) Spectra	5-10 pCi/L

1.2 Nonroutine Parameters

1.2.1 Particle Size

1.2.1.1 Applicable Documents

Guy, H. P., "Laboratory Theory and Methods for Sediment Analysis," Book 5, Chapter C1, in Techniques of Water-Resources Investigations of the United States Geological Survey, U.S. Government Printing Office, Washington, DC, 1969.

1.2.1.2 Summary of Method

The particle size of the suspended material was determined gravimetrically. A homogenous aliquot was filtered through the following sieves: 2.0 mm, 0.5 mm, 0.125 mm, and 0.062 mm. Each sieve was rinsed into a preweighed 100 mm x 50 mm pyrex dish and dried overnight in a 105° oven and reweighed. The results were calculated in mg/L greater than each fraction.

1.2.1.3 Sample Size

2 liters

1.2.1.4 Minimum Detectable Amount

0.1 mg/L

1.2.2 Specific Gravity on Suspended Particulates

1.2.2.1 Applicable Documents

No reference, private communications May 1984.

1.2.2.2 Summary of Method

The specific gravity of the suspended particulates was calculated from the densities on both a filtered and unfiltered storm water sample. These densities were determined by the DOE laboratory through the use of a liquid-density balance. The specific gravity was calculated using the following equation:

$$\text{Suspended Particulates} = \frac{\text{weight of equal volume of suspended particulate}}{\text{weight of equal volume of water displaced}}$$

$$= \frac{W_{SP} (\text{mg/L}) \times 10^{-3} (\text{g/mg})}{(D_{UF} - D_F) (\text{g/cm}^3) \times 1000 \text{ cm}^3/\text{L}}$$

Where

$W_{SP}$  = suspended solids on storm water

$D_{UF}$  = Density of unfiltered storm water

$D_F$  = Density of filtered storm water

1.2.2.3 Minimum Detectable Amount

Not applicable

**APPENDIX IV - TABLES 1 to 5**  
**QUALITY CONTROL RESULTS**

TABLE 1  
SUMMARY OF UNKNOWN REFERENCE SAMPLES  
SUBMITTED WITH BASEFLOW WATER SAMPLES

Parameter	Lab Value ( $\mu\text{g/L}$ )	True Value ( $\mu\text{g/L}$ )	% Recovery
Carbon Tetrachloride	25; 26	26.6	96
Chlorobenzene	43; 40	40.4	103
Chlorodibromomethane	32; 33	29.6	110
1,2 Dichloroethane	29; 28	25.0	114
1,1-Dichloroethylene	21; 22	20.8	103
1,2-Dichloropropane	33; 32	40.0	81
Methylene Chloride	44; 22	40.0	82
1,1,2,2-Tetrachloroethane	59; 60	50.6	118
Trans-1,2-dichloroethylene	59; 60	55.2	108
Trichloroethylene	52; 52	49.6	105
Al	720	730	99
As	220	235	94
Cd	38.6	39	99
Cr	250	261	96
Cu	330	339	97
Li	580	550	105
Hg	8.3	8.7	95
Ni	212	207	102
Se	56	50	112
Ag	1.1	1.2	92
Zn	420	418	100
Sb	9	8.2	110
Be	230	235	98
Tl	<50	25.2	-
Oil and Grease	22	20	110
Bis(2 chloroethyl ether)	272	253	108
Benzo(a)anthracene	133	315	42
3,4-Benzofluoranthene	320	246	130
Benzo(k)fluoranthene	320	246	130
Bis(2-chloroethoxy)methane	281	255	110

TABLE 1 CONTINUED

Parameter	Lab Value ( $\mu\text{g/L}$ )	True Value ( $\mu\text{g/L}$ )	% Recovery
2-chloro-naphthalene	424	251	169
1,2-Dichlorobenzene	237	250	95
1,3-Dichlorobenzene	122	148	82
Diethylphthalate	198	254	78
Di-n-Butylphthalate	288	252	114
2,4-Dinitrotoluene	200	277	72
2,6-Dinitrotoluene	184	229	80
Di-n-Octylphthalate	66	230	29
Hexachlorobenzene	214	350	61
Hexachlorobutadiene	121	157	77
Isophorone	151	149	101
N-nitrosopdimethylamine	419	352	119
phenanthrene	195	202	97
pyrene	89	298	30
1,2,4 Trichlorobenzene	217	256	85
2-chlorophenol	30	30	100
2,4-Dichlorophenol	38	50	76
2,4-Dimethylphenol	24	30	80
4,6-Dinitro-o-cresol	<50	250	0
2-Nitrophenol	38	50	76
p-chloro-m-cresol	50	75	67
pentachlorophenol	<10	75	0
phenol	<10	100	0
2,4,6-Trichlorophenol	8	25	32

TABLE 2

RESULTS OF BLIND LABORATORY AND FIELD DUPLICATE SAMPLES  
ON BASEFLOW WATER SAMPLES - NONRADIOLOGICAL ANALYSES

Parameter	Units	Field Duplicates			Laboratory Duplicates		
		Value #1	Value #2	% RSD	Value #1	Value #2	% RSD
Al	µg/L	210	200	4.3	205	210	2.1
As	µg/L	<1	<1	-	<1	<1	-
Cd	µg/L	<0.1	<0.1	-	<0.1	<0.1	-
Cr	µg/L	9	9	0.0	9	8	10
Cu	µg/L	<5	<5	-	<5	<5	-
Li	µg/L	<10	<10	-	<10	<10	-
Pb	µg/L	3	3	0.0	3	5	44
Total Hg	µg/L	<0.2	0.3	-	<0.2	0.3	-
Diss. Hg	µg/L	<0.2	<0.2	-	<0.2	<0.2	-
Ni	µg/L	4	5	20	5	10	59
Se	µg/L	<1	<1	-	<1	<1	-
Ag	µg/L	<0.2	<0.2	-	<0.2	<0.2	-
Zn	µg/L	24	30	20	27	16	46
Sb	µg/L	<1	<1	-	<1	<1	-
Be	µg/L	<1	<1	-	<1	<1	-
Tl	µg/L mg/L as CaCO <sub>3</sub>	<50	<50	-	<50	<50	-
Hardness	CaCO <sub>3</sub>	160	160	0.0	160	150	5.7
Turbidity	NTU	21	22	4.1	22	23	4.0
TSS	mg/L	18	17	5.1	18	18	0.0
TVSS	mg/L	3	3	0.0	3	3	0.0
Oil & Grease	mg/L	5	5	-	NA	NA	-
Vol. Org.	µg/L	No Compounds Detected					
Base Neutrals	µg/L	No Compounds Detected					
Acid Extract.	µg/L	No Compounds Detected					
Pest. & PCBs	µg/L	No Compounds Detected					
TKN	mg/L	0.42	0.47	10	0.47	0.54	12
NH <sub>3</sub> -N	mg/L	0.13	0.12	7.1	0.12	0.12	0.0
NO <sub>3</sub> +NO <sub>2</sub> -N	mg/L	0.83	0.83	0.0	0.83	0.83	0.0
TP	mg/L	0.20	0.17	14	0.17	0.17	0.0
T. Cn	µg/L	Not Collected			<20	<20	-
Total Phenol	µg/L	Not Collected			4	2	59

TABLE 3  
RESULTS OF BLIND FIELD DUPLICATE SAMPLES  
ON BASEFLOW WATER - RADIOLOGICAL ANALYSES

Parameters	Units	Field Duplicates <sup>1</sup>	
		Value #1	Value #2
Gross Alpha	pCi/L	10.8 $\pm$ 3.6	10.2 $\pm$ 3.5
Gross Beta	pCi/L	690 $\pm$ 70	690 $\pm$ 70
Tritium	pCi/L	544,000 $\pm$ 53,000	540,000 $\pm$ 53,000
Cs-137	pCi/L	68 $\pm$ 7	57 $\pm$ 5
Co-60	pCi/L	19 $\pm$ 2	18 $\pm$ 4

<sup>1</sup>Error terms represent 95 percent confidence limits.

TABLE 4

RESULTS OF SPLIT SAMPLE DATA WITH EPA, REGION IV  
FOR SAMPLES COLLECTED ON BASEFLOW WATER - NONRADIOLOGICAL ANALYSES

Parameter	Units	LAB: EPA	LAB: TVA	% Relative Error
Al	µg/L	<100	210	-
As	µg/L	<40	<1	-
Cd	µg/L	<10	<0.1	-
Cr	µg/L	11	9	20
Cu	µg/L	<10	<5	-
Li	µg/L	NA	<10	-
Pb	µg/L	<30	4	-
Hg	µg/L	<0.2	<0.2	-
Ni	µg/L	<20	8	-
Se	µg/L	<40	<1	-
Ag	µg/L	<10	<0.2	-
Zn	µg/L	14	21	-40
Sb	µg/L	<40	<1	-
Be	µg/L	<10	<1	-
Tl	µg/L	NA	<50	-
Total Hardness	mg/L as CaCO <sub>3</sub>	140	150	-6.9
Turbidity	NTU	17	22	-
TSS	mg/L	22	18	-26
TVSS	mg/L	5.2	3	54
Oil & Grease	mg/L	<5	<5	-
TKN	mg/L	0.45	0.50	-11
NH <sub>3</sub> -N	mg/L	0.15	0.12	22
NO <sub>3</sub> +NO <sub>2</sub> -N	mg/L	0.90	0.83	8.1
Total Phosphorus	mg/L	0.12	0.17	-34
Total Cn	µg/L	<2	<20	-
Total Phenols	µg/L	<20	3	-
Organic Priority Pollutants	µg/L	All compounds less than detectable limit.		

TABLE 5

RESULTS OF SPLIT SAMPLE DATA WITH EPA EASTERN ENVIRONMENTAL  
RADIATION FACILITY FOR SAMPLES COLLECTED ON BASEFLOW WATER -  
RADIOLOGICAL ANALYSES

Parameter	Units	EPA		TVA	
		LAB:	EERF	LAB:	WARL
Tritium	pCi/L	569,000	$\pm$ 2,000	544,000	$\pm$ 53,000
		700	$\pm$ 200	500	$\pm$ 110
Gross Alpha	pCi/L	10	$\pm$ 4	10.8	$\pm$ 3.6
		79	$\pm$ 15	31	$\pm$ 16
Gross Beta	pCi/L	520	$\pm$ 30	690	$\pm$ 70
		330	$\pm$ 20	330	$\pm$ 40
Gamma Spectral Analysis					
Cs-137	pCi/L	41	$\pm$ 4	68	$\pm$ 7
Co-60	pCi/L	20	$\pm$ 4	19	$\pm$ 2